UNITED STATES ARMY MEDICAL BIOENGINEERING RESEARCH & DEVELOPMENT LABORATORY

REPORT MEDDH-288 (R1)

ANNUAL PROGRESS REPORT
1 October 1983 - 30 September 1984

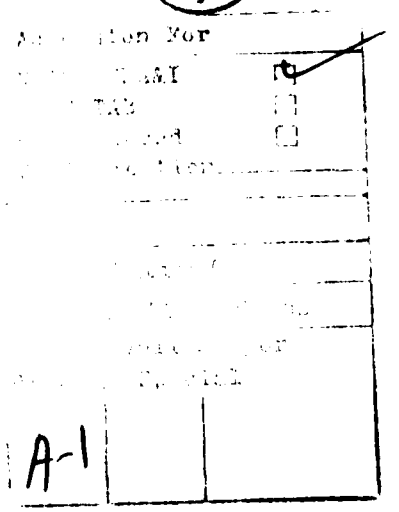
VOLUME II

FORT DETRICK, FREDERICK, MD. 21701-5010

REPORT MEDDH-288 (R1)

ANNUAL PROGRESS REPORT
1 October 1983 - 30 September 1984

V O L U M E II



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7. AUTHOR(s) CARL E. PEDERSEN, Jr., Ph.D., COL MS		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Medical Bioengineering Research and Development Laboratory Fort Detrick, Frederick, MD 21701-5010		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS See Reverse
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16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES This is the second of the two volumes of this report and contains DD Forms 1498 for all inhouse and extramural work units active at the end of FY84.

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)* Field Sanitation and Water; Conventional Weapon Systems; Smokes/Obscurants; Synthetic or Alternative Fuels; Environmental Quality; Installation Restoration, Aquatic Toxicology; Combat Medical Material; Environmental Fate; Chemical Protective Equipment; Field X-Ray Equipment; Hazardous/Toxic Waste Disposal; Pest Management; Pesticide Dispersal Equipment; Munition and other Wastewater Treatment; (see reverse)

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The Annual Progress Report, Fiscal Year 1984, summarizes in two volumes the research performed by the US Army Medical Bioengineering Research and Development Laboratory in projects authorized by The Surgeon General, the US Army, and the Commander, US Army Medical Research and Development Command, and supported by RDTE funds from the US Army Medical Research and Development Command.

→ Keywords:

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SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

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Block 19.

Chemical Hardening of Medical Equipment; Patient Dosimeter; Resuscitation Devices; Chemical Agent Identification/Quantitation; Vector Control Methods; Field Medical Refrigeration Equipment; Field Sterilization Equipment, Medical Grade Water; Field Gurney; Noninvasive Vital Sign Monitors; Controlled Release Pesticides; Microbial Fate; Organic Chemistry; Environmental Biology; Inorganic Chemistry; Hygiene, Environmental Container; Field Oxygen Generation; Teleradiography; Foreign Medical Materiel; Environmental Modelling; Inhalation Toxicology; Teratology,

REPORT MEDDH-288 (R1)

US ARMY MEDICAL BIOENGINEERING RESEARCH AND DEVELOPMENT LABORATORY ANNUAL PROGRESS REPORT FY84

US ARMY MEDICAL BIOENGINEERING RESEARCH AND DEVELOPMENT LABORATORY
Fort Detrick
Frederick, MD 21701-5010

1 October 1984

Annual Progress Report for Period 1 October 1983 - 30 September 1984

US ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND
Fort Detrick
Frederick, MD 21701-5012

NOTICE

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Disposition

Destroy this report when it is no longer needed. Do not return it to the originator.

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In-House Research

FY84 DETAIL SHEET

TITLE: (U) Formation and Evaluation of Specific Adsorbents for Removal of Waste Pesticides, Poisons and Toxins from Water

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	8	0.2
	CURRENT	11	0.1
	PROJECTED	0	0.0

MILITARY RELEVANCE: This effort has application to the detection and possible removal of TNT, RDX, HMX, and other toxic pollutants from munition production plants.

MAJOR ACHIEVEMENTS: Silica gel polymer preparations specific for ethyl orange, p-chlorophenyl methyl sulfone, alpha-chlordane, and malathion were made and isolated and their adsorption isotherms were determined. The effect of the surface phase-reversal treatment was also explored.

PUBLICATIONS/PRESENTATIONS:

"Specific Adsorbents for Wastewater Pollutants," Ramchandra K. Kulkarni and Theresa M. Trybus, 186th ACS Annual Meeting, Washington, DC. 1983.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 301045	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K. COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61101A	3A161101A91C	LA	319 APC F155
b. CONTRIBUTING			00	
c. CONTRIBUTING	None			

11. TITLE *(Precede with Security Classification Code)* (U) Formation and Evaluation of Specific Adsorbents for Removal of Waste Pesticides, Poisons and Toxins from Water

12. SUBJECT AREAS
06 09 Hygiene and Sanitation; 13 08 Industrial Processes; 07 03 Organic Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 10	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.1	11
e. KIND OF AWARD	f. CUM/TOTAL	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Kulkarni, R K
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-2036
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Adsorption; (U) Pesticides; (U) Dyes; (U) Toxins; (U) Wastewater; (U) Hazardous Waste; (U) Environmental Pollutant

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Earlier unpublished research at this Laboratory demonstrated that specific adsorbents for chlordane, malathion, and sulfone (p-Cl phenyl methyl) could be made from silica gels. It is expected that specific adsorbents made from organic polymers, rather than silica gels, would be cheaper and more efficient. It is the objective of this research to investigate the production of specific adsorbents for pollutants or chemical or biological agents using organic polymers as reported in the literature.

24. (U) Two approaches will be used: already available polymers will be crosslinked in the presence of the adsorbates and tested for specificity; organic monomers, containing covalently-bound adsorbates, will be synthesized and polymerized, and crosslinked adsorbates will be chemically removed and tested for specificity. Chlordane, malathion, and surrogate chemical agents will be tested both as pure compounds and as mixtures containing other nonspecific chemicals.

25. (U) 8310 - 8409. The selectivity of silica gel adsorbents for methyl orange/ethyl orange and chlordane/malathion was studied using the HPLC technique with mixed solutions of these adsorbates in the paired combinations indicated. Selectivity in the mixtures was unimpaired. Work with CW agent surrogates will not be initiated. Results of work with chlordane and malathion will be published as a technical report. A manuscript will be submitted to the Journal of Physical Chemistry. Further work on polymer adsorbents has been transferred to the core program in DA Project 3E162720A835AA Work Unit Number 633.

FY84 DETAIL SHEET

TITLE: (U) Development of an Automated Toxicant Screening Test Based on the Ventilatory Responses of Fish

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	31	0.5
	CURRENT	3	0.1
	PROJECTED	0	0.0

MILITARY RELEVANCE: Part of the environmental hazard assessment process for Army-relevant materials requires a determination of toxicity to fish and other aquatic organisms. The purpose of this project was to evaluate a short-term screening test for estimating the chronic toxicity of materials to fish.

MAJOR ACHIEVEMENTS: Ventilatory monitoring tests were conducted with 1,3,5-trinitrobenzene (TNB) and two fish species, the bluegill (Lepomis macrochirus) and the rainbow trout (Salmo gairdneri). Marked ventilatory responses occurred in both species of fish within 30 minutes of exposure to TNB concentrations which would usually cause death after 96 hours of exposure, but ventilatory responses were reduced or absent at lower concentrations. The monitoring system has potential for on-line toxicity monitoring, but does not function well as a screening test for chronic toxicity.

PUBLICATIONS/PRESENTATIONS:

van der Schalie, W.H. "Can biological monitoring early warning systems be useful in protecting aquatic ecosystems from toxic effluents"? Invited paper to be presented at the Ninth Symposium on Aquatic Toxicology and Environmental Fate sponsored by the American Society for Testing and Materials, 14-16 April 1985 in Philadelphia, PA.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA OG 0674	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K. COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9 LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61101A	3A161101A91C	LA	318 APC F166
b. CONTRIBUTING			00	
c. CONTRIBUTING	None			

11. TITLE *(Precede with Security Classification Code)* (U) Development of an Automated Toxicant Screening Test Based on the Ventilatory Responses of Fish

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology; 06 16 Physiology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
79 10	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.1	3
e. KIND OF AWARD	f. CUM/TOTAL	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR van der Schalie, W H
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-7627
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Lab Animals; (U) Fish; (U) Toxicants; (U) Automated; (U) Ventilatory; (U) Rainbow Trout

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Evaluation of a screening test designed to estimate the chronic toxicity of materials to fish by a technique requiring considerably less time and expense than currently available methods. The test will be used in conjunction with a program to assess the environmental hazards associated with Army-relevant materials.

24. (U) A microcomputer-based system will be used to monitor the ventilatory patterns of 30 fish exposed in groups of five to a series of toxicant concentrations. The lowest concentration affecting the ventilatory patterns will be compared to literature values for the lowest concentration of the same toxicant affecting fish survival, growth or reproduction during long-term exposure. The ability of the ventilatory monitoring system to predict chronic toxic effect levels will then be determined.

25. (U) 8310 - 840 . Two ventilatory monitoring tests were conducted with 1,3,5-trinitrobenzene (TNB). Test species were the bluegill (Lepomis macrochirus) and the rainbow trout (Salmo gairdneri). Marked ventilatory responses occurred in both fishes within 30 minutes to TNB concentrations causing death after 96 hours of exposure, but ventilatory response was reduced or absent at lower concentrations. The fish ventilation monitoring system has potential for on-line toxicity monitoring, but does not function well as a screening test for chronic toxicity. A technical report and other publications are in preparation.

FY84 DETAIL SHEET

TITLE: (U) Microbial Interactions with Guanidine

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	0	0.0
	CURRENT	26	0.4
	PROJECTED	15	0.2

MILITARY RELEVANCE: Guanidine nitrate is a major substrate in the manufacture of the military propellant nitroguanidine and is found in waste streams from the manufacturing process. The environmental fate of guanidine nitrate is currently under study in the core program and organisms have been isolated that will degrade the compound readily in the presence of glucose. The degradation of the compound by these organisms can influence treatment strategies and discharge criteria.

MAJOR ACHIEVEMENTS: Three organisms have been isolated which use guanidine as a nitrogen source for growth. Two are gram negative fermentative rods; the third has been identified as a Pseudomonad. The latter organism can grow to high titer using the compound as a nitrogen source, mineralizes the guanidinium carbon, and is the system of choice for metabolic studies. Cell-free extracts have yielded no simple enzyme system capable of transforming or catabolizing guanidine to date.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY	1. AGENCY ACCESSION DA 305995	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636

3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
84 02 01	D. CHANGE	U	U		CX	

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61101A	3A161101A91C	LA	073 APC F193
b. CONTRIBUTING				
c. CONTRIBUTING	None			

11. TITLE *(Precede with Security Classification Code)*
(U) Microbial Interactions with Guanidine

12. SUBJECT AREAS
06 06 Environmental Biology; 06 13 Microbiology; 06 09 Hygiene & Sanitation

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 02	85 09	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE	EXPIRATION
b. CONTRACT/GRANT NUMBER	
c. TYPE	d. AMOUNT
e. KIND OF AWARD	f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.4	26
85	0.2	15

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Mitchell, W R
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-2036
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Biodegradation; (U) Guanidine; (U) Munitions Pollutant; (U) Nitrogen Source

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Guanidine is a pollutant found in waste streams resulting from US Army propellant manufacture and its environmental fate is currently under study in the laboratory. The objective of this project is to elucidate the means by which environmental microorganisms utilize guanidine and to identify the organisms capable of using it as a nitrogen source for growth.

24. (U) Microorganisms will be grown on medium containing glucose with guanidine present as a sole source of nitrogen. Species capable of utilizing the compound will be purified and identified. Products resulting from microbial interactions with the compound will be isolated and identified.

25. (U) 8402 - 8409. Three organisms have been isolated which use guanidine as a nitrogen source for growth. Two are gram negative fermentative rods; the third has been identified as a Pseudomonad. The latter organisms can grow to high titer on the compound as a nitrogen source, mineralizes guanidine carbon, and is the system of choice for metabolic studies.

FY1984 DETAIL SHEET

TITLE: (U) Fate of Bacillus thuringiensis (Serotype H-14) in Mosquito Larvae Killed by Delta-Endotoxin

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	0	0.0
	CURRENT	12	0.2
	PROJECTED	10	0.2

MILITARY RELEVANCE: Bacillus thuringiensis (serotype H-14) represents the first major biological control larvicidal agent to be registered for commercial production and application. This material is now used in many integrated pest management (IPM) programs including some at military installations where pesticide use regulations require minimum negative impact to the environment.

MAJOR ACHIEVEMENTS: Amplification of delta-endotoxin, the entity produced by Bacillus thuringiensis (serotype H-14) which is toxic to mosquito larvae, has been confirmed in cadavers of Aedes aegypti. This is the first indication of the presence of a cycling mechanism in mosquitoes which could contribute to the presence and persistence of this organism in nature.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA303166	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 01 16	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61101A	3A161101A91C	LA	072 APC F192
b. CONTRIBUTING			00	
c. COORDINATING	None			

11. TITLE *(Precede with Security Classification Code)* (U) Fate of Bacillus thuringiensis (Serotype H-14) in Mosquito Larvae Killed by Delta-Endotoxin

12. SUBJECT AREAS

0606 Environmental biology; 0603 Biology; 0613 Microbiology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 10	85 09	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE — EXPIRATION

b. CONTRACT/GRANT NUMBER

c. TYPE — d. AMOUNT

e. KIND OF AWARD — f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.2	12
1985	0.2	10

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL
Pedersen, C E

d. TELEPHONE NUMBER *(include area code)*
301-663-7685

20. PERFORMING ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF PRINCIPAL INVESTIGATOR
Vorgetts, L J

d. TELEPHONE NUMBER *(include area code)*
301-663-7237

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY/CIVILIAN APPLICATION: H

f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
Nelson, J H

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Biological Control; (U) Predation; (U) Bti; (U) Delta-Endotoxin

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The possibility of propagation of Bacillus thuringiensis (serotype H-14) var. israelensis (Bti) and amplification of delta-endotoxin in mosquito larvae cadavers will be investigated. To date, no natural cycle for the propagation of Bti has been reported in the scientific literature. Collateral evidence from evaluations of Bti based insecticides indicates that Bti may develop and propagate in intact mosquito cadavers after larvae ingest a lethal dose of delta-endotoxin, the toxic factor produced by Bti. This program is directly related to the Laboratory's mission for research in military vector control.

24. (U) Mosquito larvae (Aedes aegypti) will be infected with known amounts of Bti. Larval mortality will be recorded and cadavers will be incubated for selected periods of time. Cadavers will then be examined for the presence or absence of Bti spores and delta-endotoxin crystals. The quantity of spores and crystalline toxin will be quantified using one or more of the following: bioassays with mosquito larvae, histological examination of tissues using phase-contrast and electron microscopy, and serological analysis.

25. (U) (8401-8409) Bioassays of Ae. aegypti larvae killed by the Bti endotoxin indicated that amplification of toxin may occur in cadavers. Cadavers assayed within 8 hours of exposure to a lethal concentration of Bti were more toxic to assay larvae than unexposed cadavers killed by other means. Similar results were obtained when larvae were exposed to a sublethal concentration of Bti and subsequently killed. This effect appeared to increase, reaching a maximum in cadavers that were 2-3 days old. Histological procedures were developed to detect evidence microscopically. Serological methods are currently under development.

FY84 DETAIL SHEET

TITLE: (U) Determination of Phenoxyacid Herbicides by HPLC

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	0	0.0
	CURRENT	9	0.1
	PROJECTED	0	0.0

MILITARY RELEVANCE: Rapid and sensitive analytical methods for determining phenoxyacid herbicides in surface and groundwater need to be developed for use at military installations where monitoring of soil and water for herbicides may be necessary.

MAJOR ACHIEVEMENTS: A method for 2,4-D, 2,4,5-T, and silvex has been developed using HPLC (high performance liquid chromatography) with UV detection at 235 or 280 nm and solid phase extraction. Samples are hydrolyzed and concentrated on C8 cartridges. The herbicides are eluted with methanol and determined by HPLC. The time-consuming derivatization step has been eliminated. Lower limits of detection for these three phenoxyacid herbicides are approximately 10 ppb by the improved method.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 305996	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K. COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61101A	3A161101A91C	LA 00	070 APC F190
b. CONTRIBUTING				
c. CONTRIBUTING	None			

11. TITLE *(Precede with Security Classification Code)*
(U) Determination of Phenoxyacid Herbicides by HPLC

12. SUBJECT AREAS
06 09 Hygiene and Sanitation; 07 03 Organic Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 10	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.1	9
e. KIND OF AWARD	f. CUM/TOTAL	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Hoke, S H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-2036
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Herbicides; (U) Phenoxyacids; (U) High Performance Liquid Chromatography; (U) Priority Pollutants

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To determine whether or not HPLC/UV detection in conjunction with separation cartridges can be used for low ppb level detection of phenoxyacid herbicides. This has general relevancy to the military requirement for pollution abatement.

24. (U) Concentration efficiencies and recoveries of herbicides from separation cartridges will be determined. Detection limits for HPLC in conjunction with separation cartridges will then be evaluated.

25. (U) 8310 - 8409. A rapid method for determining phenoxyacid herbicides by HPLC has been developed. Samples are hydrolyzed and concentrated on C8 separation cartridges. The herbicides are eluted with methanol and determined by HPLC. No derivatization step is required. Detection limits for 2,4-D, 2,4,5-T, and silvex were approximately 10 ppb. A draft manuscript for journal publication has been completed.

FY84 DETAIL SHEET

TITLE: (U) Alkaline Hypochlorite Treatment of Trichothecenes: A Product Study

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	0	0.0
	CURRENT	18	0.1
	PROJECTED	15	0.1

MILITARY RELEVANCE: The objective of the project, to advance basic knowledge of chemical detoxification mechanisms of trichothecenes, is relevant to both mission areas of chemical defense and occupational health.

MAJOR ACHIEVEMENTS: Products from a typical trichothecene, verrucarol, have been isolated and separated. A structure for the major product has been deduced and verification is in progress.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 305524	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61101A	3A161101A91C	LA	010 APC F191
b. CONTRIBUTING				
c. CONTRIBUTING	None			

11. TITLE *(Precede with Security Classification Code)*
(U) Alkaline Hypochlorite Treatment of Trichothecenes: A Product Study

12. SUBJECT AREAS
07 03 Organic Chemistry; 06 09 Hygiene and Sanitation

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 10	85 09	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE	EXPIRATION
b. CONTRACT/GRANT NUMBER	
c. TYPE	d. AMOUNT
e. KIND OF AWARD	f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.1	18
85	0.1	15

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Burrows, E P
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-2036
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Trichothecenes; (U) Hypochlorite; (U) Detoxification; (U) Verrucarol; (U) Nuclear magnetic resonance

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To further our understanding of mechanisms of chemical detoxification of trichothecenes by identification of the products resulting from alkaline hypochlorite treatment. This research has relevance to the detection of mycotoxins in field water supplies treated with hypochlorite.

24. (U) The reaction products are to be separated by chromatographic procedures, and their structures deduced by mass spectrometry and nuclear magnetic resonance spectroscopy.

25. (U) 8310 - 8409. The reaction of a typical type A trichothecene, verrucarol, yielded four rearrangement products, all containing one or more chlorine atoms. Opening of the epoxide ring is a predominant process.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY	1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
	DA 301046	84 10 01	DD-DR&E(AR) 636

3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
83 10 01	H. TERMINATION	U	U		CX	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61101A	3A161101A91C	LA	323 APC F158
b. CONTRIBUTING				
c. CONTRIBUTING	None			

11. TITLE *(Precede with Security Classification Code)* (U) Feasibility of Using an Anticholinesterase-sensitive Unicell in Detection of Trace-level Chemical Agents

12. SUBJECT AREAS 15 02 Chemical, Biological, and Radiological Warfare; 06 13 Microbiology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 10	84 02	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.1	8
e. KIND OF AWARD	f. CUM/TOTAL	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Bausum, H T
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-7207
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Anticholinesterase Agents; (U) Chemical Defense; (U) Bioassay; (U) Yeast

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Using a choline-requiring yeast, to develop a system in which growth of the organism is dependent on the activity of a cholinesterase. To characterize this cholinesterase-dependent growth response as to its sensitivity to inhibitors such as parathion, to determine response times, using various methods of measuring growth. The effect of presently undetected trace levels of chemical agents on soldier health and effectiveness is not known. Biodetection holds promise of offering a complementary test modality in which results might require several hours but reflect increased sensitivity for trace-level detection.

24. (U) Choline-requiring mutant strains of the yeast Saccharomyces cerevisiae showing zero growth without choline will be obtained and their response to acetylcholine determined. If they are unable to use this or another choline ester for growth, an animal cholinesterase will be supplied. Once a system has been established in which growth is dependent on an added choline ester, the capacity of anticholinesterase compounds to suppress or prevent growth will be investigated. The levels of various organophosphorus substances detectable by this means will be determined as well as time required for detection. Use of a noncholine-requiring strain in parallel with test strains will enhance sensitivity and afford control. Various means of measuring growth (turbidimetric, chemical, viable numbers) will be explored.

25. (U) 8310 - 8402. Project was terminated due to unavailability of necessary microbial strains.

FY84 DETAIL SHEET

TITLE: (U) Feasibility of Using an Anticholinesterase-sensitive Unicell in Detection of Trace-level Chemical Agents

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	6	0.1
	CURRENT	8	0.1
	PROJECTED	0	0.0

MILITARY RELEVANCE: The Army's test kit (XM272) is capable of detecting G agents at levels of 0.02 mg/L. It is not known whether lower levels of these agents in natural and potable waters can produce subacute or chronic effects or impair soldier effectiveness. Biodetection holds promise of offering a complementary test modality in which results require several hours but reflect increased sensitivity for trace-level detection.

MAJOR ACHIEVEMENTS: Project terminated due to unavailability of necessary microbial strains.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
				DA OG 0654	84 10 01	DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
83 10 01	K. COMPLETION	U	U		CX	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61101A	3A161101A91C	LA	324 APC F172
b. CONTRIBUTING			00	
c. CONTRIBUTING	None			

11. TITLE *(Precede with Security Classification Code)* (U) Evaluation of the Effect of Antifoam Additive to Beef Extract Eluent on the Recovery of Enteroviruses from Water and Wastewater

12. SUBJECT AREAS

06 06 Environmental biology; 06 13 Microbiology; 06 09 Hygiene & Sanitation

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
79 10	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.1	4
e. KIND OF AWARD	f. CUM/TOTAL	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Taylor, G W
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-2340
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*

(U) Enterovirus; (U) Antifoam; (U) Environmental Waters; (U) Detection

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To evaluate the effect of an antifoam additive to beef extract eluent on the recovery of enteroviruses from water and wastewater. This work will provide improved capability for virus assay in current microbiological evaluations of the Army's new technology field water treatment systems (reverse osmosis water purification units).

24. (U) The Bentonite system for virus recovery with Antifoam B (AFB) will be compared to the Viradel (pH 3.5 plus Al+3) system using environmental waters as recommended by an EPA round robin test.

25. (U) 8310 - 8409. The virus recovery systems have been studied with tap water and are being completed using environmental waters of higher humic acid content. The viradel system was superior to the bentonite system. Antifoam B improved recoveries by both systems. A technical report is to be prepared.

FY84 DETAIL SHEET

TITLE: (U) Evaluation of the Effect of Antifoam Additive to Beef Extract Eluent on the Recovery of Enteroviruses from Water and Wastewater

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	18	0.2
	CURRENT	4	0.1
	PROJECTED	0	0.0

MILITARY RELEVANCE: This study will provide improved virus detection capability for the Army's new-generation Reverse Osmosis Water Purification Unit (ROWPU).

MAJOR ACHIEVEMENTS: This study has shown that the addition of 0.18% Antifoam B (Dow Corning) to the beef extract eluent (3% at pH 9.0) has improved the recovery of enteroviruses collected on various filter media. This system also reduced the foaming that occurs during the elution process. The active enhancing ingredient in Antifoam B was the anionic surfactant. An anionic detergent, dodecylbenzene sulfonic acid showed similar enhanced recovery of poliovirus. The anti-foam activity was in the polydimethylsiloxane moiety of Antifoam B.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA301452	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K.COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61101A	3A161101A91C	LA	330 APC F163
b. CONTRIBUTING			00	
c. [illegible]G	None			

11. TITLE *(Precede with Security Classification Code)* (U) Effects of Bacillus thuringiensis var. israelensis on a Predator Mosquito, Toxorhynchites amboinensis

12 SUBJECT AREAS
0606 Environmental biology; 0603 Biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 11	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.1	4
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Anderson, L M
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Nelson, J H
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Biological Control; (U) Predation; (U) Bti; (U) Toxorhynchites; (U) Insects; (U) Mosquitoes

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Ascertain the effects of one biological control agent, Bacillus thuringiensis var. israelensis (Bti) on a predator mosquito species Toxorhynchites amboinensis, which also has potential as a biological control agent for mosquitoes. The integrated pest management (IPM) program is dependent upon basic studies of this nature to provide information about control agents that may be incorported into the IPM program.

24. (U) Using laboratory assays, infect the larvae of Tx. amboinensis with Bti in both the presence and absence of a prey species of mosquito, Aedes aegypti, to determine the effects of different concentrations of Bti on these mosquitoes.

25. (U) (8310-8409) Recent laboratory tests have been conducted to examine the ultrastructure of uninfected and Bti infected larvae (Tx. amboinensis and Ae. aegypti) with the scanning electron microscope. Results have shown the breakdown of the ultrastructure, but no Bti spores have been identified. The information from this research will be submitted to a journal for publication.

Anderson, L. M., Nelson, J. H. "Effect of Aedes aegypti larvae on the susceptibility of Toxorhynchites amboinensis to Bacillus thuringiensis serotype-14." Presentation by Dr. J. H. Nelson, American Mosquito Control Association Annual Meeting, Toronto, Canada, March 1984.

U.S. G.P.O. 1984-421-646/17001

FY1984 DETAIL SHEET

TITLE: (U) Effects of Bacillus thuringiensis var. israelensis on a Predator Mosquito, Toxorhynchites amboinensis

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	20	0.1
	CURRENT	4	0.1
	PROJECTED	0	0.0

MILITARY RELEVANCE: Bacillus thuringiensis var. israelensis (Bti) has recently been registered by the Environmental Protection Agency and is now being produced commercially. This material has been widely used in many integrated pest management (IPM) programs where pesticide use regulations require minimum negative impact to the environment. Since the military services most likely will use increasing amounts of Bti, it is vital to know the impact of Bti on all beneficial insects, including predator mosquitoes such as Toxorhynchites.

MAJOR ACHIEVEMENTS: Laboratory tests indicated that even though Aedes aegypti is definitely more sensitive to Bti than Tx. amboinensis, if enough Bti is applied to adequately control Ae. aegypti larvae, this treatment level will have detrimental effects on the Tx. amboinensis population. Recent laboratory tests have been conducted to examine the ultrastructure of uninfected and Bti infected larvae (Tx. amboinensis and Ae. aegypti) with the scanning electron microscope. Results have shown the breakdown of the ultrastructure, but no Bti spores have been identified.

PUBLICATIONS/PRESENTATIONS: Anderson, L. M., Nelson, J. H. "Effect of Aedes aegypti larvae on the susceptibility of Toxorhynchites amboinensis to Bacillus thuringiensis serotype-14." Presentation by Dr. J. H. Nelson, American Mosquito Control Association Annual Meeting, Toronto, Canada, March 1984.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 301055	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY H. TERMINATION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61101A	3A161101A91C	LA	331 APC F161
b. CONTRIBUTING			00	
c. CONTRIBUTING	None			

11. TITLE *(Precede with Security Classification Code)* (U) Determining the Feasibility of Using Titanium Dioxide Films for Degrading Organics in Sewage and Other Toxic Pollutants

12. SUBJECT AREAS
07 02 Inorganic Chemistry; 06 09 Hygiene and Sanitation

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 09	84 09	DA	C. In-House

17. CONTRACT/GRANT
a. DATE EFFECTIVE — EXPIRATION
b. CONTRACT/GRANT NUMBER
c. TYPE — d. AMOUNT
e. KIND OF AWARD — f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.0	0
85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL
Pedersen, C E
d. TELEPHONE NUMBER *(include area code)*
(301) 663-7685

20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS
Fort Detrick
Frederick, MD 21701-5010
c. NAME OF PRINCIPAL INVESTIGATOR
Rosencrance, A B
d. TELEPHONE NUMBER *(include area code)*
(301) 663-2036

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY/CIVILIAN APPLICATION: H

f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
Hoke, S H
g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Titanium Dioxide; (U) Catalytic Degradation; (U) Water Purification; (U) Photolysis

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To study titanium dioxide as a catalyst for degradation of organics in water. This has general relevancy to the military requirement for pollution abatement.

24. (U) The approach is to coat a vessel with a thin stationary film of titanium dioxide. This eliminates the need for a slurry which requires stirring, cuts down the penetration of light and requires mechanical collection of the catalyst. Such a coated vessel containing contaminated water will be exposed to sunlight or a sunlamp and the disappearance of the organic substance followed by chemical analysis.

25. (U) 8310 - 8409. Due to manpower constraints, further progress on this research was not possible in FY84.

FY84 DETAIL SHEET

TITLE: (U) Determining the Feasibility of Using Titanium Dioxide Films for Degrading Organics in Sewage and Other Toxic Pollutants

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	2	0.1
	CURRENT	0	0.0
	PROJECTED	0	0.0

MILITARY RELEVANCE: The use of sunlight to oxidize materials in sewage as a tertiary treatment technique or to degrade military related toxic pollutants in water has considerable appeal since the process is not energy intensive.

MAJOR ACHIEVEMENTS: None. This effort was terminated in FY84 because of manpower constraints.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 301048	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 01 31	4. KIND OF SUMMARY H. TERMINATION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61101A	3A161101A91C	LA	332 APC F154
b. CONTRIBUTING			00	
c. CONTRIBUTING	None			

11. TITLE *(Precede with Security Classification Code)*
(U) Identification of a 1,3-Dinitrobenzene Biodegrading Microorganism

12. SUBJECT AREAS
06 06 Environmental Biology; 06 13 Microbiology; 06 09 Hygiene and Sanitation

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 02	84 01	DA	C. In-House

17. CONTRACT/GRANT
a. DATE EFFECTIVE — EXPIRATION
b. CONTRACT/GRANT NUMBER
c. TYPE — d. AMOUNT
e. KIND OF AWARD — f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.0	0
85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL
Pedersen, C E
d. TELEPHONE NUMBER *(include area code)*
(301) 663-7685

20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS
Fort Detrick
Frederick, MD 21701-5010
c. NAME OF PRINCIPAL INVESTIGATOR
Mitchell, W R
d. TELEPHONE NUMBER *(include area code)*
(301) 663-2036
f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
Hargett, H T
g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY/CIVILIAN APPLICATION: H

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Biodegradation; (U) 1,3-Dinitrobenzene; (U) Munitions Pollutant; (U) Mineralization

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To demonstrate that a microbial isolate will degrade and mineralize the munitions pollutant 1,3-dinitrobenzene and to identify the organism. Following its identification, the organism will be entered in the American Type Culture Collection.

24. (U) Taxonomical tests including gram and flagellar staining, motility, and biochemical characterization will be used to identify the organism. Growth conditions for the organism will be optimized and its capability to biodegrade 1,3-dinitrobenzene will be documented.

25. (U) 8310 - 8401. Research was not conducted and will not be initiated in view of the demands of the core program and new developments in the core projects.

FY84 DETAIL SHEET

TITLE: (U) Identification of a 1,3-Dinitrobenzene Biodegrading Microorganism

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	2	0.1
	CURRENT	0	0.0
	PROJECTED	0	0.0

MILITARY RELEVANCE: 1,3-Dinitrobenzene is known to occur in waste streams from munitions manufacturing. Previous studies at USAMBRDL have demonstrated that it is a biodegradable compound. A definition of the organisms which can degrade it and the means by which it is degraded could have impact on discharge criteria as well as future treatment technologies.

MAJOR ACHIEVEMENTS: None. This effort was not initiated because of manpower constraints.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
				DA OG 8688	84 10 01	DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
83 10 01	D. CHANGE	U	U		CX	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	002 APC F202
b. CONTRIBUTING				
c. CONTRIBUTING	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Basic Research in Aquatic Toxicology

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 10	CONT	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.8	43
e. KIND OF AWARD	f. CUM/TOTAL	85	0.7	52

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR van der Schalie, W H
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-7627
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Lab Animals; (U) Aquatic Toxicology; (U) Fish; (U) Histopathology; (U) Daphnia magna; (U) RAM III

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To improve the predictive capability of screening tests currently used to evaluate the impact of Army-relevant materials on aquatic organisms. This research is relevant to Army needs for compliance with discharge limitations.

24. (U) The histopathologic response of fish to Army-relevant toxicants during early life stage tests will be compared to known chronic effects to see if the predictive ability of the early life stage test can be improved. Compounds to be tested include Dursban and 2,4-dinitrotoluene (2,4-DNT). The effects of similar amounts of 1,3,5-trinitrobenzene (TNB) applied in constant and fluctuating patterns on the aquatic invertebrate Daphnia magna will be evaluated to assess the influence of varying toxicant application patterns on toxicity. The use of fish for evaluating the carcinogenic potential of materials will be tested.

25. (U) 8310 - 8409. Histopathologic examination of fish exposed to Dursban in an early life stage test was initiated. About half of the planned acute tests for evaluating the relative effects of constant and fluctuating exposures on the acute toxicity of TNB to daphnids were completed. Pulsed toxicant exposures were less toxic than constant exposures. Studies with the medaka (Oryzias latipes) indicated that temperatures of over 35 degrees C could be tolerated. The effect of elevated temperature on the time to tumor induction and the incidence of tumors caused by diethylnitrosamine will be evaluated.

FY84 DETAIL SHEET

TITLE: (U) Basic Research in Aquatic Toxicology

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	61	2.1
	CURRENT	43	0.8
	PROJECTED	52	0.7

MILITARY RELEVANCE: Research in this area is designed to improve the Army's ability to evaluate the environmental hazards of materials released during the production of chemicals, training exercises, and other Army activities. Specific emphasis is on evaluating the use of fish in carcinogenicity testing and on increasing the predictive capability of tests used to evaluate the effects of Army-relevant materials on aquatic organisms.

MAJOR ACHIEVEMENTS: Fish held in clean water for 1 year after exposure to 2,4-dinitrotoluene (2,4-DNT), 2,6-DNT, and a mixture of the two isomers were sacrificed and are undergoing histologic examination for evidence of tumors. Studies with the Japanese rice fish Oryzias latipes show that tests with carcinogens can be conducted at temperatures up to 10°C higher than the commonly used test temperature. The use of increased temperature to enhance tumor production and lessen the time to tumor production in a carcinogen screening test is being explored. About half of the planned tests for evaluating the relative effects of constant and fluctuating exposures of 1,3,5-trinitrobenzene on daphnids have been completed. Pulsed toxicant exposures were less toxic than continuous exposures.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 301054	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	003 APC F203
b. CONTRIBUTING				
c. ~~CONTRIBUTING~~	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Aquatic Toxicology Test Method Development

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 10	85 06	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.4	9
e. KIND OF AWARD	f. CUM/TOTAL	85	0.4	15

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR van der Schalie, W H
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-7627
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Lab Animals; (U) Aquatic Toxicology; (U) Daphnia magna; (U) Chronic Toxicity; (U) Standard Methods; (U) RAM III

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To participate in a collaborative effort to develop a standardized static renewal chronic test with the aquatic invertebrate Daphnia magna. This test will be useful for the evaluation of the toxicity of Army-relevant materials to aquatic organisms. This research is relevant to Army needs for compliance with discharge limitations.

24. (U) Simultaneous toxicity tests will be conducted in this Laboratory and several others so that the reproducibility of a standard test protocol can be evaluated. Six test materials will be used in each laboratory. In a first phase, this Laboratory helped to select an appropriate food and dilution water combination and to define any areas of the protocol requiring modification. In the second phase, 12 laboratories will conduct chronic tests with each test material. Data from this study will be used to evaluate the usefulness of the protocol as a standard method for evaluating the toxicity of materials to Daphnia magna.

25. (U) 8310 - 8409. The second phase of testing was initiated and collaborative testing with three of the six test materials was completed.

FY84 DETAIL SHEET

TITLE: (U) Aquatic Toxicology Test Method Development

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	26	1.0
	CURRENT	9	0.4
	PROJECTED	15	0.4

MILITARY RELEVANCE: Army compliance with effluent discharge limitations and other environmental regulations frequently requires assessment of the toxicity of Army-relevant materials to aquatic organisms. Standardization of the basic aquatic toxicity tests that are used to evaluate the hazard of Army-relevant materials is important to ensure consistent results and to prevent costly over- or under-treatment of waste effluents which could result from waste discharge standards based on poor toxicity test results.

MAJOR ACHIEVEMENTS: As part of an interagency agreement between the U.S. Environmental Protection Agency and the Army, this Laboratory is participating with 11 other U.S. laboratories in a collaborative evaluation of a toxicity testing protocol which is used to determine the chronic toxicity of materials to the aquatic invertebrate Daphnia magna. In a first phase, this Laboratory helped to select an appropriate food and defined dilution water combination and to identify areas of the protocol requiring modification. In the second phase, the 12 laboratories will conduct tests with each of six test materials. So far, tests with two of the six materials have been completed.

PUBLICATIONS/PRESENTATIONS:

Surprenant, D.C., R.E. Bentley, W. van der Schalie, and T.R. Shedd. An Assessment of Several Media and Diets for Culturing and Testing with Daphnia magna. Submitted for presentation at the Ninth Symposium on Aquatic Toxicology and Environmental Fate sponsored by the American Society for Testing and Materials, 14-16 April 1985 in Philadelphia, PA.

Bentley, R.E., Surprenant, D.C., W. van der Schalie, and L. Williams. Collaborative Study of Daphnia magna Static Renewal Assays. Submitted for presentation at the Ninth Symposium on Aquatic Toxicology and Environmental Fate sponsored by the American Society for Testing and Materials, 14-16 April 1985 in Philadelphia, PA.

Submitted for presentation at the Ninth Symposium on Aquatic Toxicology and Environmental Fate sponsored by the American Society for Testing and Materials, 14-16 April 1985 in Philadelphia, PA.

FY1984 DETAIL SHEET

TITLE: (U) Pesticide Dispersal Unit, Solid, Helicopter Slung

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	66	1.1
	CURRENT	27	0.6
	PROJECTED	0	0.0

MILITARY RELEVANCE: Medical personnel engaged in field operations need the capability for aerial dispersal of solid pesticide formulations to ensure rapid treatment of large areas inaccessible by ground equipment but too small for efficient use of larger aerial dispersal equipment. Currently, field units have no item of equipment with the capability although their mission and TOE require it.

MAJOR ACHIEVEMENTS: A commercially available spreader which is slung beneath a helicopter on the helicopter's cargo hook was adapted for military use. The Pesticide Dispersal Unit, Solid, Helicopter Slung, was approved for type classification at an In-Process Review, December 1982.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0B6190	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K.COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	64717A	3S464717D832	AA	014 APC F566
b. CONTRIBUTING				
c. CONTRIBUTING	CARDS NO. 1213R			

11. TITLE *(Precede with Security Classification Code)*
(U) Pesticide Dispersal Unit, Solid, Helicopter Slung

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0606 Environmental biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
76 10	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.6	27
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Nelson, J H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Reams, W H g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Helicopter Rig; (U) Solid Dispersal; (U) Aerial Applications; (U) Mosquito Control; (U) Solid Insecticide; (U) RAM I

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Identify a suitable commercial, helicopter slung, pesticide dispersal unit for applying solid formulations of insecticides, which would (a) be capable of dispersing insecticides when slung beneath a helicopter, (b) require no modification of the aircraft, and (c) be capable of applying adequate swath widths and deposition rates for controlling disease vectors in combat situations or CONUS.

24. (U) A Simplex spreader was evaluated with various pesticide formulations under a variety of conditions and was found to be unsatisfactory due largely to the vertically actuated gate system. A Chadwick, Inc., applicator with a horizontally actuated gate system was procured and modified for remote control operation. Feasibility and military adaptability have been established under field conditions.

25. (U) (8310-8409) The equipment was type classified.

DD FORM 1498 83 MAR EDITION OF MAR 68 IS OBSOLETE. U.S. G.P.O. 1984-421-646/12001

FY1984 DETAIL SHEET

TITLE: (U) Liner, Heated, Patient Holding and Evacuation System

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	27	0.4
	CURRENT	41	0.8
	PROJECTED	250	4.5

MILITARY RELEVANCE: This project will provide a means of protecting sick or wounded troops from additional complications in cold environments while awaiting or being transported through the evacuation process.

MAJOR ACHIEVEMENTS: The initial development consisting of a polypropylene-fired system circulating warm ethylene-glycol solution through a tubulated liner proved unreliable. A Norwegian development using charcoal fuel and circulating warm air was then evaluated. This system suffered from fuel instability, inadequate heat transfer, and other problems. The effort has now been transferred back to the propane/liquid system because certain modifications have come along that show promise of solving the initial reliability problems. A new system was contracted for and was received along with drawings. Engineering tests uncovered a problem with the press regulator, when operating at temperatures of $-30^{\circ}F$ and below. A contract is being negotiated to develop a pressure regulator that will operate at the required low temperatures. Upon successful completion of the contract, development tests will be conducted.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOA6282	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	64717A	3S464717D832	BB	004 APC F555
b. CONTRIBUTING				
c. CXXXXXXXXXX	CARDS NO. 1416R			

11. TITLE *(Precede with Security Classification Code)*
(U) Liner, Heated, Patient Holding and Evacuation System

12. SUBJECT AREAS 0612 Medical and hospital equipment; 0607 Escape, rescue, and survival; 0617 Protective equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
73 04	85 09	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE	EXPIRATION
b. CONTRACT/GRANT NUMBER	
c. TYPE	d. AMOUNT
e. KIND OF AWARD	f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.8	41
1985	4.5	250

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Thayer, C R
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Evacuation Bag; (U) Arctic Medicine; (U) Cold Climate Medical Materiel; (U) Patient Transportation; (U) RAM II

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop a field patient holding and evacuation system capable of maintaining casualties at desired, controlled temperatures in extreme cold climates for prolonged periods. The current field means of protecting injured/sick military personnel in a cold environment from additional complications resulting from exposure to the cold is inadequate from the point of injury through the evacuation system.

24. (U) Design and fabricate developmental prototypes based upon previous engineering effort. Existing state-of-the-art materiel will be used. The major technical barrier is to achieve required temperature duration capability with required lightweight characteristics.

25. (U) (8310-8409) Evaluation of An Improved Army Life Support Power Source System (ALPSS) (propane/liquid) has been completed. Some low temperature problems with a gas pressure regulator have been experienced and are being worked by the contractor. Development tests are scheduled to begin 2nd Quarter FY 85.

FY1984 DETAIL SHEET

TITLE: (U) Sprayer, Powered, ULV, Portable

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	12	0.3
	CURRENT	48	1.0
	PROJECTED	51	1.0

MILITARY RELEVANCE: Previous experiences in Southeast Asia and the Mideast have demonstrated the devastating effect outbreaks of arthropod-borne diseases have on field operations. Many outbreaks start from a small localized area, too big for a field sanitation team to handle but too small for efficient treatment using vehicle-mounted equipment. To fill this technical gap, a small, portable ultra-low volume (ULV) sprayer could be used for local control of flies, mosquitoes, and other flying insects.

MAJOR ACHIEVEMENTS: Several commercially available hand-held ULV sprayers that are either gasoline-engine driven or battery powered were evaluated. Evaluations demonstrated that existing battery-powered sprayers produce spray droplets that are too large to provide maximum mosquito control efficiency. Two gasoline-powered, portable ULV sprayers have been tested and found suitable for military procurement. A recommendation to pursue off-the-shelf acquisition strategy was made during an In-Process Review in July 1983.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG0677	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	64717A	3S464717D832	AA	003 APC F583
b. CONTRIBUTING				
c. CONTRIBUTING	CARDS NO. 1430R			

11. TITLE *(Precede with Security Classification Code)*
(U) Sprayer, Powered, ULV, Portable

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0606 Environmental biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
79 10	85 03	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	1.0	48
e. KIND OF AWARD	f. CUM/TOTAL	1985	1.0	51

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Nelson, J H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Arthropod Control; (U) Lightweight; (U) Durable; (U) Disease Vectors; (U) Portable; (U) Ultra-Low Volume (ULV) Dispersal;

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*
(U) RAM I

23. (U) Identify a commercially available, lightweight, durable, portable unit capable of dispersing ultra-low volume (ULV) pesticide formulations. This unit will be used by preventive medicine personnel in combat zones and CONUS for controlling disease vectors and pest arthropods. This project involves engineering and operational evaluation of insecticide dispersal equipment for incorporation into field medical units.

24. (U) Review commercially available portable ULV sprayers. Suitable units will be field evaluated. After entomological feasibility has been established, modifications, if necessary, will be made and formal testing coordinated with responsible agencies.

25. (U) (8310-8409) The transition checklist was submitted on 11 July 1984, and this Laboratory is awaiting receipt of the certificate of transition from the US Army Troop Support Command.

FY84 DETAIL SHEET

TITLE: (U) Microbial Degradation and Yeast Bioassay of Trichothecene Mycotoxins

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	51	0.7
	CURRENT	41	0.7
	PROJECTED	55	0.7

MILITARY RELEVANCE: As potential chemical warfare agents, the trichothecene mycotoxins could threaten the military effectiveness and health of field personnel. Simple detection systems as well as a knowledge of the longevity of trichothecenes in natural waters is necessary in assessing the risk associated with the consumption of such waters.

MAJOR ACHIEVEMENTS: An analytical system adequate to support microbial degradation studies could not be developed and these degradation studies were not initiated. Following the screening of a diversity of yeast species, a simple quantitative assay system for T2 and other mycotoxins was developed using Cryptococcus luteolus on solid support medium. The system can detect from one to two micrograms of T2 toxin and its response is linear with the toxin concentration from 30 micrograms to 2.5 micrograms.

PUBLICATIONS/PRESENTATIONS:

"Microbial Fate and Yeast Bioassay of Trichothecenes," DOD Toxin Defense Coordination Meeting, Aberdeen Proving Ground, MD. 1983.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 302675	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3M161102BS12	AE	032 APC F429
b. CONTRIBUTING				
c. CONTRIBUTING	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Microbial Degradation and Yeast Bioassay of Trichothecene Mycotoxins

12. SUBJECT AREAS 06 09 Hygiene and Sanitation; 06 13 Microbiology;
15 02 Chemical, Biological, and Radiological Warfare

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 05	85 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.7	41
e. KIND OF AWARD	f. CUM/TOTAL	85	0.7	55

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS Fort Detrick, Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Taylor, G W
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-2036
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Trichothecene; (U) Yeast Bioassay; (U) Microbial Degradation; (U) Degradation Kinetics; (U) RAM I; (U) RAM III

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The first objective of the research is to provide estimates of the longevity of priority trichothecenes in surface waters. The second objective is to determine if it is feasible to use yeasts as a simple, inexpensive, and rapid assay and detection system for the trichothecenes in Army field water supplies. There is presently no detection system for use by military in the field.

24. (U) To estimate the longevity of T-2 toxin in surface waters, natural water samples will be incubated with the toxin, and levels of bacteria and rates of toxin disappearance will be measured. To determine if it is feasible to utilize yeasts as an assay or detection system for trichothecenes, various yeast species will be screened for their sensitivity to T-2 toxin. The most sensitive organism(s) will be used for the development of a simple quantitative bioassay based on growth inhibition. Attempts will be made to develop a simple indicator system for inhibition based on colorimetric, turbidimetric, or physical parameters.

25. (U) 8310 - 8409. An analytical system necessary to support microbial degradation studies could not be developed and these studies were not initiated. Following the screening of 12 yeast species, a simple and rapid quantitative system for T2 and other mycotoxins was developed. Optimization of the system has resulted in assays capable of detecting toxin at the one to two microgram level. The system is being refined and attempts will be made to develop a simple colorimetric indicator system. All future work will be conducted addressing only the yeast bioassay.

FY84 DETAIL SHEET

TITLE: (U) Chemical Detection and Identification of Trichothecene Mycotoxins in Field Water Supplies

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	53	0.5
	CURRENT	27	0.3
	PROJECTED	0	0.0

MILITARY RELEVANCE: In the event that trichothecenes are used as chemical agents, a field-adaptable analytical method for their determinaton in water is needed to ensure safety of personnel.

MAJOR ACHIEVEMENTS: A solid phase extraction method with quantitative analysis by densitometry has been devised and documented.

PUBLICATIONS/PRESENTATIONS:

Burrows, E.P. Spectrodensitometric Quantitative Determination of Trichothecenes in Water: Application to T-2 Toxin and T-2 Tetraol. Technical Report 8406. (DRAFT).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 302673	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K. COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3M161102BS12	AE	031 APC F428
b. CONTRIBUTING				
c. CONTRIBUTING XXXXXXXX	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Chemical Detection and Identification of Trichothecene Mycotoxins in Field Water Supplies

12. SUBJECT AREAS

06 09 Hygiene and Sanitation; 15 02 Chemical, Biological, and Radiological Warfare

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 05	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.3	27
e. KIND OF AWARD	f. CUM/TOTAL	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Burrows, E P
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-2036
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY/CIVILIAN APPLICATION: I	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Trichothecene; (U) Mycotoxins; (U) Thin-layer Chromatography; (U) Solid Phase Extraction; (U) RAM I

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To develop reliable and rapid methodology for the detection, identification, and quantitation of certain trichothecenes in Army field water supplies.

24. (U) Trichothecenes in water will be concentrated by means of solid phase extraction columns to levels detectable by thin-layer chromatography (TLC) using a colorimetric/densitometric method specific for the toxins.

25. (U) 8310 - 8409. The method has been successfully applied to trichothecenes ranging in polarity from T-2 (relatively non-polar) to T-2 tetraol (most polar). A technical report, "Quantitative Determination of Trichothecenes in Water," is in preparation.

FY84 DETAIL SHEET

TITLE: (U) Bioassay for Mycotoxins in Water Using Brine Shrimp Larvae

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	28	0.4
	CURRENT	52	0.9
	PROJECTED	0	0.0

MILITARY RELEVANCE: The possibility of mycotoxins being used in warfare presents a serious threat to military personnel. A need exists, therefore, to develop tests for these hazardous chemicals in field water.

MAJOR ACHIEVEMENTS: Brine shrimp have been evaluated for use as a field bioassay for mycotoxins. The LC50 values have been obtained for each of four mycotoxins.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 302681	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K. COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3M161102BS12	AE	030 APC F427
b. CONTRIBUTING				
c. ~~CONTRIBUTING~~	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Bioassay for Mycotoxins in Water Using Brine Shrimp Larvae

12. SUBJECT AREAS
06 03 Biology; 15 02 Chemical, Biological, and Radiological Warfare; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 05	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.9	52
e. KIND OF AWARD	f. CUM/TOTAL	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Hoke, S H
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-2036
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Toxicity; (U) Brine Shrimp; (U) Trichothecene Mycotoxins; (U) Artemia salina; (U) RAM I

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The purpose of this project is to develop a rapid field test for trichothecene mycotoxin toxicity in Army field water supplies. There is presently no detection system for use by military in the field.

24. (U) Literature studies on the detection of mycotoxins using brine shrimp will be reviewed. Promising procedures with potential for field adaptation will be selected and evaluated in the laboratory. LC-50s will be established for each of four trichothecenes.

25. (U) 8310 - 8409. Data have been obtained on the toxicity of methanol as a candidate solvent for the recovery of toxins from adsorption cartridges. Experiments have shown that it is practicable to hatch and maintain brine shrimp nauplii for daily and routine testing. Toxicity data (LC50s) for T-2, HT-2, 4,6-diacetoxyscirpenol, and 4-deoxynivalenol have been determined and will be reported in a technical report.

U.S. G.P.O. 1984-421-646/17001

FY1984 DETAIL SHEET

TITLE: (U) Vector Control Science Base

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	58	0.6
	CURRENT	42	0.5
	PROJECTED	44	0.6

MILITARY RELEVANCE: The military has historically adopted particular technologies long after they have been proven in the civil sector. This concept has created a lag that has often resulted in the military acquiring outmoded technology. As the technology advances at an even greater rate, the resultant lag becomes greater so that the problem compounds itself. The military must have state-of-the-art technology in order to perform its mission to support the combat soldier. Attempting to combat vector-borne diseases with outmoded technology will result in inefficiency, wastefulness, and failure to carry out the mission.

MAJOR ACHIEVEMENTS: Using in-house expertise and extensive interrelationships with other government agencies and the private sector, basic research has been conducted in the area of integrated pest management. Through extensive field research, the rotary wing aerial dispersal of selective biological insecticides was ascertained to be both technically feasible and economically practical. Although the data from field studies are preliminary, it appears that the ultra-low volume of insecticides with diluents is significantly (greater than 60 percent) more effective in causing mortality of adult mosquitoes than the conventional methodology using technical grade insecticides.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0G5997	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISP'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3M161102BS10	AS	331 APC F251
b. CONTRIBUTING				
c. C[redacted]G	STOG 82/83-6.2/3			

11. TITLE *(Precede with Security Classification Code)*
(U) Vector Control Science Base

12. SUBJECT AREAS
0603 Biology; 0612 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 10	CONT	DA	C. In-House

17. CONTRACT/GRANT
a. DATE EFFECTIVE — EXPIRATION
b. CONTRACT/GRANT NUMBER
c. TYPE — d. AMOUNT
e. KIND OF AWARD — f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.5	42
1985	0.6	44

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS Fort Detrick, Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Nelson, J H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Vorgetts, L J g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Pest Management; (U) Integrated Pest Management; (U) Vector Control; (U) Methodology; (U) RAM I

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop and maintain a pest management science base that will (a) ensure the applied research program is current in new developments in pest management, and (b) develop new militarily unique approaches to integrated pest management. This project is a vital part of a comprehensive vector control program, ensuring a steady stream of new, innovative, and often novel approaches to effective control of arthropod vector populations.

24. (U) Through use of in-house expertise and extensive interrelationships with other government agencies and the private sector, conduct basic research in the area of integrated pest management. The approach will be centered on militarily unique aspects of the program.

25. (U) (8310-8409) Testing is continuing to determine the comparative effectiveness of diluted versus technical grade malathion for adult mosquito control by ground equipment. Aerial application will be included in these tests in FY 85.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOA6290	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K.COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	64717A	3S464717D832	BB	015 APC F568
b. CONTRIBUTING				
c. [redacted]	CARDS NO. 1604R			

11. TITLE *(Precede with Security Classification Code)*
(U) Environmental Protection Containers for Medical Supplies

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0617 Protective equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
74 09	84 06	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE	EXPIRATION
b. CONTRACT/GRANT NUMBER	
c. TYPE	d. AMOUNT
e. KIND OF AWARD	f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.6	27
1985	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Conway, W H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Patzer, N H g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Environmental Container; (U) Field Container; (U) Arctic Field Cont[illegible]ner; (U) Medical Supply Container; (U) Arctic Supplies; (U) Arctic Protection; (U) RAM II

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop a container to protect freezable military medical items in an Arctic environment. This equipment will perform an ancillary function related to medical treatment in a field environment.

24. (U) Design, fabricate, and evaluate a container to meet the requirements of Arctic use.

25. (U) (8310-8409) Problems identified in the maintenance evaluation were resolved. The Technical Data Package supporting procurement of this item has been prepared and forwarded, through appropriate channels, to the Defense Medical Standardization Board for action. This task is complete.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE. U.S. G.P.O. 1984-421-646/17001

FY1984 DETAIL SHEET

TITLE: (U) Environmental Protection Containers for Medical Supplies

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	23	0.5
	CURRENT	27	0.6
	PROJECTED	0	0.0

MILITARY RELEVANCE: Large quantities of medical supplies require adequate protection from freezing during field operations in arctic or subarctic regions. A dedicated piece of equipment is needed to store and preserve these freezable medical materials and to protect them during several hours of unpowered transport.

MAJOR ACHIEVEMENTS: A lightweight, insulated chest that includes electrical strip heaters and a temperature control was developed and subjected to development and operational testing. A final prototype incorporating revisions stemming from a maintenance evaluation was constructed. This prototype was subjected to further development tests to ensure that no performance changes resulted from the modifications. Type classification and procurement have been recommended, and a Technical Data Package has been forwarded to the Defense Materiel Standardization Board for appropriate action.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0B6249	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K.COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	64717A	3S464717D832	BA	041 APC F573
b. CONTRIBUTING				
c. CXXXXXXXXG	CARDS NO. 1415R			

11. TITLE *(Precede with Security Classification Code)*
(U) Low Capacity Radiographic System, Field

12. SUBJECT AREAS
0605 Clinical medicine; 0612 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
79 01	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	4.4	242
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Salisbury, L L
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) X-Ray; (U) Field Medicine; (U) Field Equipment; (U) Radiology; (U) RAM II

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Identify a suitable low capacity radiographic system to include film processor(s), compatible film(s), cassettes and other operating accessories for AMEDD usage (except dental).

24. (U) Search existing industrial sources for functional devices that can be adopted. If none are available, modify, design, or contract for the design of new devices.

25. (U) (8310-8409) This program was terminated by an In-Process Review in FY 84.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE. ☆U.S. G.P.O. 1984-421-646/17001

FY1984 DETAIL SHEET

TITLE: (U) Low Capacity Radiographic System, Field

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	43	0.4
	CURRENT	242	4.4
	PROJECTED	0	0.0

MILITARY RELEVANCE: Currently available X-ray systems are not suitable for use by small medical units outside of field type hospitals based on weight, complexity, and utility requirements. The need is critical for a low capacity X-ray apparatus.

MAJOR ACHIEVEMENTS: Two contracts were let to develop a system meeting the Army's specific requirement for a low-capacity field X-ray unit. One contract was terminated when time and funding requirements were not met. Two units, delivered by the second contractor, were tested in-house. These units were modified and sent for operational testing. The effort was terminated by an In-Process Review held in FY 84.

PUBLICATIONS/PRESENTATIONS: Gula, Jr., Philip R., Toms, Jr., Glenn E., Shankle, James E., and Hodge, Jr., John W.; Low Capacity X-Ray System for Field Use; Developmental Test (DT I) Report, MR 1-84, January 1984.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA305615	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	64717A	3S464717D832	BA	043 APC F575
b. CONTRIBUTING	62772A	3S162772A874	BA	240
c. CONTRIBUTING	STOG 82/83-6.2/4			

11. TITLE *(Precede with Security Classification Code)*

(U) Pesticide Dispersal Unit, Multicapability, Helicopter Slung

12. SUBJECT AREAS

0612 Medical and hospital equipment; 0606 Environmental biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 10	86 01	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE | EXPIRATION

b. CONTRACT/GRANT NUMBER

c. TYPE | d. AMOUNT

e. KIND OF AWARD | f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	2.4	132
1985	2.4	139

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*

Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL

Pedersen, C E

d. TELEPHONE NUMBER *(include area code)*

301-663-7685

20. PERFORMING ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS

Fort Detrick
Frederick, MD 21701-5010

c. NAME OF PRINCIPAL INVESTIGATOR

Nelson, J H

d. TELEPHONE NUMBER *(include area code)*

301-663-7237

21. GENERAL USE

Foreign Intelligence Not Applicable

MILITARY/CIVILIAN APPLICATION: H

f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

Boobar, L R

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*

(U) Helicopter Rig; (U) Aerial Application; (U) Mosquito Control; (U) Liquid Dispersal; (U) Solid Dispersal; (U) Multicapability

23. TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

Dispersal; (U) RAM II

23. (U) Identify a suitable commercial, helicopter slung, dispersal unit for applying both liquid and solid formulations of insecticides, which would (a) be capable of dispensing both liquid and solid insecticides when slung beneath a helicopter, (b) require no modification of the aircraft, and (c) be capable of applying adequate swath widths and deposition rates for controlling disease vector in combat situations or CONUS.

24. (U) A Simplex unit has been selected as the most suitable unit for field feasibility testing. Modifications will be made prior to further operational testing. The unit has been used successfully in actual mosquito control operations.

25. (U) (8310-8409) The Simplex unit was operationally tested in Panama during 3rd Quarter FY 84 and tested in a tri-service operation in the Philippines during 4th Quarter FY 84. The unit is being considered for type classification.

FY1984 DETAIL SHEET

TITLE: (U) Pesticide Dispersal Unit, Multicapability, Helicopter Slung

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	0	0.0
	CURRENT	132	2.4
	PROJECTED	139	2.4

MILITARY RELEVANCE: Medical personnel engaged in field operations need the capacity for aerial dispersal of liquid and solid pesticide formulations. A unit is needed to ensure rapid treatment of large areas inaccessible by ground equipment but too small for efficient use of larger aerial dispersal equipment. Currently, field units have no item of equipment with the capability to disperse solid formulations, and the standard unit for dispersal of liquid pesticides, being internally mounted, represents a health and safety hazard to the helicopter crew.

MAJOR ACHIEVEMENTS: A multicapability unit, which is slung beneath a helicopter on the helicopter's cargo hook, has been adapted for military use. The unit has been successfully used during operational tests in Panama during 3rd Quarter FY 84 and in the Philippines during 4th Quarter FY 84.

PUBLICATIONS/PRESENTATIONS: Hodge, Jr., John W., Shankle, James E., Toms, Jr., Glenn E., and Gula, Jr., Philip R.; Pesticide Dispersal Unit, Multipurpose, Helicopter Slung; Developmental Test Report (DT I), MR 7-84, May 1984.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG0701	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	64717A	3S464717D832	AA	044 APC F581
b. CONTRIBUTING				
c. [redacted]	CARDS NO. 1429R			

11. TITLE *(Precede with Security Classification Code)*
(U) Trap, Mosquito, Light, Collapsible

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0606 Environmental biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
79 10	85 12	DA	C. In-House

17. CONTRACT/GRANT
a. DATE EFFECTIVE | EXPIRATION
b. CONTRACT/GRANT NUMBER
c. TYPE | d. AMOUNT
e. KIND OF AWARD | f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.3	16
1985	0.4	18

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Buescher, M D
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* O'Connor, R J g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Pest Mosquitoes; (U) Mosquito Surveys; (U) Population Studies; (U) RAM I

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop a collapsible mosquito light trap which is powered solely from AC sources. The trap may be used with 110 volt outlets or with portable gasoline generators for disease vector and pest mosquito surveys. This will replace the standard mosquito light trap (NSN 3740-00-607-0337, LIN X24251) which is noncollapsible and approaching obsolescence.

24. (U) Design and fabricate a suitable collapsible, AC powered, mosquito light trap and conduct field evaluations in various habitats.

25. (U) (8310-8409) A prototype design has been fabricated and is currently being field and laboratory tested to assure capability in trapping disease vectors in a more effective manner than with existing mosquito light traps. Testing will also develop guidelines for design features for durability and reliability.

FY1984 DETAIL SHEET

TITLE: (U) Trap, Mosquito, Light, Collapsible

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	65	1.0
	CURRENT	16	0.3
	PROJECTED	18	0.4

MILITARY RELEVANCE: Light traps are the primary method of detecting and estimating the threat of mosquito disease vector populations. The Trap, Mosquito, Light, Collapsible, is a portable light trap which may be used with 110 volt outlets or a portable gasoline generator for stationary or mobile pest surveillance. This item will replace the standard mosquito light trap (NSN 3740-00-607-0337, LIN X24251) which is noncollapsible and approaching obsolescence.

MAJOR ACHIEVEMENTS: A prototype design has been fabricated and three operational field studies have been conducted. A revised killing jar has been fabricated and successfully tested. Modifications to include an optional CO_2 sampling device are currently under study.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0B6193	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISP'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	64717A	3S464717D832	AA	046 APC F576
b. CONTRIBUTING				
c. COORDINATING	CARDS NO. 1404A			

11. TITLE *(Precede with Security Classification Code)*
(U) Pesticide Dispersal Unit, Portable, Backpack

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0606 Environmental biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
76 10	85 03	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.1	5
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.1	6

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Nelson, J H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Backpack; (U) Solid/Liquid Dispersal; (U) Arthropod Control; (U) Lightweight; (U) Durable; (U) Disease Vectors;

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*
(U) Portable; (U) RAM I

23. (U) Identify a commercially available, lightweight, durable, backpack unit capable of dispersing solid or liquid pesticide formulations. This unit would be used by preventive medicine personnel in combat zones and CONUS for controlling disease vectors and pest arthropods.

24. (U) Review commercially available backpack units. Suitable units will be evaluated. After operational feasibility has been determined, a suitable item of equipment will be selected for off-the-shelf (OTS) acquisition strategy.

25. (U) (8310-8409) The equipment was type classified in December 1982. The transition checklist was submitted on 11 July 1984, and this Laboratory is awaiting receipt of the certificate of transition from the US Army Troop Support Command.

FY1984 DETAIL SHEET

TITLE: (U) Pesticide Dispersal Unit, Portable, Backpack

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	9	0.1
	CURRENT	5	0.1
	PROJECTED	6	0.1

MILITARY RELEVANCE: An operational need exists for a power driven backpack unit that can dispense both liquid and solid pesticide formulations. The unit is needed to provide control during field operations in localized and remote areas where vehicular or aerial dispersal equipment cannot be used or is not readily available.

MAJOR ACHIEVEMENTS: Available commercial backpack units were evaluated from an engineering aspect to determine the best candidate units for operational evaluation. Selected units were evaluated by an operational user to determine any unforeseen problems in deployment. A Pesticide Dispersal Unit, Portable, Backpack, was approved for type classification at an In-Process Review, December 1982.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0B6195	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K.COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	64717A	3S464717D832	AA	047 APC F577
b. CONTRIBUTING				
c. [illegible]G	CARDS NO. 1424R			

11. TITLE *(Precede with Security Classification Code)*
(U) Pesticide Dispersal Unit, Liquid, Helicopter Slung

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0606 Environmental biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
76 10	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.4	16
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Nelson, J H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Reams, W H g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Helicopter Rig; (U) Liquid Dispersal; (U) Aerial Application; (U) Mosquito Control; (U) Liquid Insecticide; (U) RAM I

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Identify a suitable commercial, helicopter slung, dispersal unit for applying liquid formulations of insecticides, which would (a) be capable of dispensing liquid insecticides when slung beneath a helicopter, (b) require no modification of the aircraft, and (c) be capable of applying adequate swath widths and deposition rates for controlling disease vectors in combat situations or CONUS.

24. (U) A Transland Unit has been selected as the most suitable unit for field feasibility. Modifications will be made prior to further operational testing. The unit has been used successfully in actual field mosquito control operations.

25. (U) (8310-8409) The equipment was type classified.

DD FORM 1498 83 MAR EDITION OF MAR 68 IS OBSOLETE. ☆U.S. G.P.O. 1984-421-646/17021

FY1984 DETAIL SHEET

TITLE: (U) Pesticide Dispersal Unit, Liquid, Helicopter Slung

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	51	0.7
	CURRENT	16	0.4
	PROJECTED	0	0.0

MILITARY RELEVANCE: Medical personnel engaged in field operations need the capacity for aerial dispersal of liquid pesticide formulations. The unit is needed to ensure rapid treatment of large areas inaccessible by ground equipment but too small for efficient use of larger aerial dispersal equipment. Current standard item represents a health and safety hazard to the helicopter crew since the unit is internally mounted instead of slung.

MAJOR ACHIEVEMENTS: A Transland sprayer has been modified to include a ultra-low volume Beecomist nozzle system and a means for effective control of unit functions from the interior of the helicopter. The unit is completely independent of the helicopter and easily jettisonable in an emergency. The unit has been modified to satisfy the deficiencies observed in Operational Test II. Operational Test IIa was completed in 1st Quarter FY 83. Type classification was completed in July 1983.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 305522	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 02 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	121 APC F633
b. CONTRIBUTING				
c. [redacted]	STOG 82/82-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Pollutant Adsorbent Systems

12. SUBJECT AREAS
07 03 Organic Chemistry; 07 04 Physical Chemistry; 11 09 Plastics

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 02	CONT	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	1.4	78
e. KIND OF AWARD	f. CUM/TOTAL	85	1.5	85

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Kulkarni, R K
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-2036
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY/CIVILIAN APPLICATION: L	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Munitions; (U) Wastewater; (U) Adsorption; (U) RAM III

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To study specific and selective adsorbents made from polymers based on silica gels polyacrylates, or polystyrenes for the detection and removal of TNT, RDX, and HMX from water. This research is relevant to military compliance with environmental criteria and standards for munitions wastewater effluents.

24. (U) Specific adsorbent properties of specially-prepared polymers will be tested. Polymers will be prepared for testing in two ways. First, polymerize selected monomers (either commercial or synthetic) in the presence of the desired adsorbents, crosslink the polymers, and remove the adsorbates by selective solvent extraction. The polymers will be dried and tested for selective adsorption. Secondly, the monomers containing the adsorbate residues will be polymerized in a suitable solvent, crosslinked and used for selective adsorption, after removal of adsorbate molecules by solvolysis.

25. (U) 8402 - 8409. Project too new to show progress.

DD FORM 1498 83 MAR EDITION OF MAR 68 IS OBSOLETE. U.S. G.P.O. 1984-421-646/17001

FY84 DETAIL SHEET

TITLE: (U) Pollutant Adsorbent Systems

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	0	0.0
	CURRENT	78	1.4
	PROJECTED	85	1.5

MILITARY RELEVANCE: TNT, RDX, HMX, and their degradation products occur in low concentrations in the effluent wastewater from munitions production plants. The feasibility of preparating specific polymer-like silica gels or polyacrylates/polystyrenes has been demonstrated in earlier studies at this Laboratory. The relevance of this effort lie in the possible use of these specific adsorbents for removal or detection of pollutants for military compliance with environmental criteria and standards for effluent water.

MAJOR ACHIEVEMENTS: Several cross-linked polymers based on acrylics and silica gels were prepared by standard methods and tested for specificity for TNT, RDX, and HMX. The results did not show the desired degree of specificity and selectivity; however, research is continuing to produce polymers with the desired characteristics.

PUBLICATIONS/PRESENTATIONS: None.

FY1984 DETAIL SHEET

TITLE: (U) Steam Vacuum Pulse Sterilizer (SVP) System

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	94	2.0
	CURRENT	53	1.0
	PROJECTED	55	1.0

MILITARY RELEVANCE: Two 16-inch diameter, gravity-displacement steam sterilizers (NSN 6530-00-926-21451 and 6530-00-027-5260) are available for field installations. They are of aging design, and their speed and size do not satisfy the expected needs of throughput and pack size. A steam sterilization capability in field hospitals is mandatory, and a need exists for a sterilizer of the prevacuum type to replace the slower and less efficacious units. The substitution of a larger, faster item for units currently in stock will improve support.

MAJOR ACHIEVEMENTS: A contract was awarded in 1979 for the design of a Steam Vacuum Pulse Sterilizer System and a power module. More than a year of additional development engineering was performed at USAMBRDL culminating in Development Test II. Operational Test II was completed at Fort Belvoir, VA, in April 1984. An In-Process Review is expected in 2nd Quarter FY 85.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG9318	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63732A	3S463732D836	BB	007 APC F310
b. CONTRIBUTING			BA	
c. C[redacted]	CARDS NO. 1420R			

11. TITLE *(Precede with Security Classification Code)*
(U) Steam Vacuum Pulse Sterilizer (SVP) System

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0613 Microbiology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 12	85 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	1.0	53
e. KIND OF AWARD	f. CUM/TOTAL	1985	1.0	55

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Prensky, W C
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Salisbury, L L g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Field Sterilizers; (U) Power Module; (U) Steam Sterilization; (U) Microbiology; (U) RAM II

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Conduct an engineering evaluation of the steam vacuum pulse sterilizer system developed for field Army medical use.

24. (U) Evaluate OT II report, make necessary modifications, and prepare Technical Data Package prior to type classification action.

25. (U) (8310-8409) Operational testing (OT II) was completed in April 1984, and the report was received in August 1984. The Technical Data Package is being prepared.

DD FORM 1498 83 MAR EDITION OF MAR 68 IS OBSOLETE.

FY1984 DETAIL SHEET

TITLE: (U) Controlled-Release, Environmentally Degradable, Pesticide Formulations

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	19	0.2
	CURRENT	9	0.1
	PROJECTED	10	0.1

MILITARY RELEVANCE: Controlled-release environmentally degradable pesticide formulation systems are needed to replace the persistant, broad-spectrum pesticides, like DDT, that have been cancelled or suspended. The current formulations of new compounds are short-lived and have relatively short shelf life; thus, they are militarily less acceptable. These shortcomings can be overcome through application of a controlled-release formulation. This should result in reduced pesticide use, an important aspect of military vector control programs.

MAJOR ACHIEVEMENTS: In 1978 controlled release formulations of Altosid and Dursban were laboratory tested and provided control from 190 to 270 days. During 1979 a formulation of Abate was field tested in Panama and Arkansas with an effective period of approximately 4 weeks. The following year Abate silicate formulations were field tested and gave 9 weeks' effective control. Bimodal Abate pellets were laboratory tested during 1981 with approximately 39 weeks' effectiveness. First-generation BT serotype 14 controlled release floating granule formulations were tested giving two to three times greater persistence in the laboratory than a standard formulation. Laboratory tests of first-generation, microencapsulated BT serotype 14 formulations were completed. Data from these studies were used to formulate second-generation products using different size microcapsules and cell walls that are currently under test. The persistence of first-generation formulations (5-10 days) is targeted to be increased to 21-30 days in second-generation formulations. Two commercial BT serotype 14 sustained release formulations were tested against Culex, Aedes, and Anopheles species in the laboratory. Field tests of these formulations are scheduled.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOB6223	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63732A	3S463732D836	AA	005 APC F305
b. CONTRIBUTING				
c. C[redacted]	CARDS NO. 1400A			

11. TITLE *(Precede with Security Classification Code)*
(U) Controlled-Release, Environmentally Degradable, Pesticide Formulations

12. SUBJECT AREAS
0606 Environmental biology; 0603 Biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
77 10	CONT	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE	EXPIRATION
b. CONTRACT/GRANT NUMBER	
c. TYPE	d. AMOUNT
e. KIND OF AWARD	f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.1	9
1985	0.1	10

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Nelson, J H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Buescher, M D g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22 KEYWORDS *(Precede EACH with Security Classification Code)* (U) Pesticide Formulations; (U) Controlled-Release; (U) Pest Management; (U) Environmental Compatibility; (U) Vector Control;

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*
(U) RAM I

23. (U) Identify and evaluate environmentally compatible controlled-release pesticide formulations of military relevance for use in support of tactical operations and fixed military installation pest management/vector control programs. These results will provide the military with a new series of effective pesticides that are registered for medically important arthropods.

24. (U) Utilizing commercially prepared controlled-release pesticide formulations and carriers potentially suitable for military use, quantify release rates and degradation rates in the laboratory. Those formulations found to be best in laboratory tests will be evaluated in field tests to verify laboratory results under natural environmental conditions. Determinations both in the laboratory and in the field will be biological effectiveness, environmental compatibility, cost effectiveness, and compatibility with current standard pesticide dispersal equipment.

25. (U) (8310-8409) Laboratory tests of first generation microencapsulated BT serotype 14 formulations were completed. Data from these studies were used to formulate second generation products using different size microcapsules and cell walls that are currently under test. The persistence of first generation formulations (5-10 days) is targeted to be increased to 21-30 days in second generation formulations. Two commercial, BT serotype 14 sustained release formulations were tested against Culex, Aedes, and Anopheles species in the laboratory. Field tests of these formulations are scheduled.

FY1984 DETAIL SHEET

TITLE: (U) Form/Fit/Function Study for ISO/TEMPER

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	18	0.2
	CURRENT	0	0.0
	PROJECTED	0	0.0

MILITARY RELEVANCE: This task is an attempt to standardize field military medical shelters within NATO/SEATO military forces.

MAJOR ACHIEVEMENTS: Two sizes of International Organization for Standardization (ISO) shelters were procured, and medical element configuration studies were initiated. A decision was then made to accept data from a similar Navy study, which terminated this particular effort.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG8686	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K.COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63732A	3S463732D836	BB	004 APC F306
b. CONTRIBUTING				
c. [redacted]	CARDS			

11. TITLE *(Precede with Security Classification Code)*

(U) Form/Fit/Function Study for ISO/TEMPER

12. SUBJECT AREAS

0612 Medical and hospital equipment; 0602 Bioengineering

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 10	83 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.0	0
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Conway, W H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*

(U) Hospital, Field; (U) Shelter; (U) Field Medicine; (U) Bioengineering; (U) RAM II

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Determine a functional arrangement of medical equipment within expandable International Organization for Standardization (ISO) shelters and Tent, Extendable, Modular, Personnel (TEMPER) tents contemplated for use in field hospitals. The study will include such factors as packability/transportability of equipment within the folding shelters, placement of utilities, power requirements, and other pertinent factors.

24. (U) Procure and set up specimen shelters. Different arrangements of the required equipment for various hospital elements will be made within the shelters, and these will be evaluated for the factors defined above under objective.

25. (U) (8310-8409) This task was terminated in FY 83 and is considered complete.

FY84 DETAIL SHEET

TITLE: (U) Treatment of Munition Production Wastes

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	28	0.1
	CURRENT	0	0.0
	PROJECTED	0	0.0

MILITARY RELEVANCE: This project relates to evaluation of public health and environmental health hazards associated with operation of Army ammunition plants. The findings are relevant to the Army's requirement for compliance with the NPDES permit system and provisions of the National Environmental Policy Act (NEPA).

MAJOR ACHIEVEMENTS: An interactive computer model of Holston Army Ammunition Plant Industrial Liquid Waste Treatment Plant has been devised to simulate the effect of upset conditions in compliance with discharge limits.

PUBLICATIONS/PRESENTATIONS:

Carnahan, R.P., P. Marsack, and W.D. Burrows. 1984. Waste Treatment Plant Design at Holston Army Ammunition Plant. Phase I, Part I, Technical Report 8401. (DRAFT).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 301069	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K. COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	160 APC F891
b. CONTRIBUTING				
c. [redacted]	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Treatment of Munition Production Wastes

12. SUBJECT AREAS
06 09 Hygiene and Sanitation; 07 03 Organic Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 03	84 09	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE	EXPIRATION
b. CONTRACT/GRANT NUMBER	
c. TYPE	d. AMOUNT
e. KIND OF AWARD	f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.0	0
85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL
Pedersen, C E

d. TELEPHONE NUMBER *(include area code)*
(301) 663-7685

20. PERFORMING ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF PRINCIPAL INVESTIGATOR
Burrows, W D

d. TELEPHONE NUMBER *(include area code)*
(301) 663-7104

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY/CIVILIAN APPLICATION: L

e. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) RDX; (U) HMX; (U) TNT; (U) Wastewater; (U) (TAX); (U) (SEX); (U) RAM III

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objectives are to review the design basis for the Holston Army Ammunition Industrial Liquid Waste Treatment Plant, scheduled to become operational in 1st QTR FY83; to model waste treatment methodologies with respect to removal of possible hazardous components; and to anticipate any operational problems. This project relates to evaluation of public health and environmental health hazards associated with operation of Army ammunition plants.

24. (U) A literature survey, site visit, and modeling will be used to design bench scale and pilot scale wastewater test facilities.

25. (U) 8310 - 8409. Work is completed. A technical report will be published - Evaluation of Industrial Liquid Waste Treatment Plant Design at Holston Army Ammunition Plant.

FY84 DETAIL SHEET

TITLE: (U) Evaluate Dimethylnitrosamine

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	53	0.6
	CURRENT	0	0.0
	PROJECTED	0	0.0

MILITARY RELEVANCE: This study relates to evaluation of the public health and environmental health hazards associated with discharge of wastewater from the B-line of Holston Army Ammunition Plant. The findings are relevant to the Army's requirement for compliance with the NPDES permit system and other provisions of the National Environmental Policy Act (NEPA).

MAJOR ACHIEVEMENTS: Methods have been developed for analysis of RDX, HMX, TAX, and SEX in wastewater to a lower limit of detection of 0.1 mg/L. Periodic samples have been analyzed for dimethylnitrosamine.

PUBLICATIONS/PRESENTATIONS:

Brueggemann, E.E. 1981. HPLC Analysis of SEX, HMX, TAX, RDX, and TNT in Wastewater. Technical Report 8206, AD A127348.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA OG 9214	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K. COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	159 APC F878
b. CONTRIBUTING				
c. CONTRIBUTING	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Evaluate Dimethylnitrosamine

12. SUBJECT AREAS
06 09 Hygiene and Sanitation; 07 03 Organic Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 10	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.0	0
e. KIND OF AWARD	f. CUM/TOTAL	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Burrows, W D
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-7104
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) RDX; (U) HMX; (U) TNT; (U) Biodegradation; (U) RAM III

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objective is to provide analytical support to contract DAMD17-81-C-1118 (Bell, George Washington University), which concerns munitions wastewater treatment in semi-continuous activated sludge treatment systems. This study relates to evaluation of the public health and environmental health hazards associated with discharge of wastewater at Holston Army Ammunition Plant.

24. (U) Methods will be developed for analysis of RDX, HMX, and TNT in wastewater using HPLC. Samples provided by the contractor will be analyzed. Satisfactory analytical methods will be developed.

25. (U) 8310 - 8409. Work is complete. Methods have been developed for analysis of RDX, HMX, and TNT, as well as for the by-product nitramines TAX and SEX, to detection levels of 0.1 mg/L or better (Brueggemann, E.E. 1981. HPLC Analysis of SEX, HMX, TAX, RDX, and TNT in Wastewater. Technical Report 8206, AD A127348.) Measurement of dimethylnitrosamine by thermal electron analysis has been successfully achieved and will be reported later.

FY84 DETAIL SHEET

TITLE: (U) Nitroguanidine Wastewater Pollution Control Technology Development

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	49	0.8
	CURRENT	0	0.0
	PROJECTED	0	0.0

MILITARY RELEVANCE: This project relates to evaluation of public health and environmental health hazards associated with discharge of wastewater from Sunflower Army Ammunition Plant. The findings are relevant to the Army's requirement to comply with the NPDES permit system and aspects of the National Environmental Policy Act (NEPA).

MAJOR ACHIEVEMENTS: Procedures have been developed for characterization and treatment of wastewaters from manufacture of nitroguanidine.

PUBLICATIONS/PRESENTATIONS:

Burrows, W.D. 1983. Nitroguanidine Wastewater Pollution Control Technology: Phase I Report. MR 3-83.

Burrows, E.P., E.E. Brueggemann, E.H. McNamee, L.J. Baxter, and S.H. Hoke. 1984. Nitroguanidine Wastewater Pollution Control Technology: Phase II. Characterization and Analytical Methods Development. Technical Report 8311, AD A141176.

Noss, C.I. and R.H. Chyrek. 1984. Nitroguanidine Wastewater Pollution Control Technology: Phase III. Treatment with Ultraviolet Radiation, Ozone, and Hydrogen Peroxide. Technical Report 8309, AD A139389.

Small, M.J. 1984. Nitroguanidine Wastewater Pollution Control Technology: Phase III. Ion Exchange and Carbon Adsorption Treatment. Technical Report 8310, AD A141161.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 301042	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K. COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	156 APC F895
b. CONTRIBUTING			BE	
c. ~~CONTRIBUTING~~	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Nitroguanidine Wastewater Pollution Control Technology Development

12. SUBJECT AREAS
06 09 Hygiene and Sanitation; 07 03 Organic Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 10	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.0	0
e. KIND OF AWARD	f. CUM/TOTAL	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Burrows, W D
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-7104
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Nitroguanidine; (U) Guanidine Nitrate; (U) Wastewater; (U) Pollution Control; (U) RAM III

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objective is to analyze wastewaters generated during proveout of the Sunflower Army Ammunition Plant nitroguanidine facility and to predict potential pollution problems from the operation. This project relates to evaluation of public health and environmental health hazards associated with operation of Army ammunition plants.

24. (U) Document review, site visits, and sampling and analysis will be employed to detect and quantitate pollutants unique to nitroguanidine manufacture.

25. (U) 8310 - 8409. Work is complete. Reports are:

Burrows, W.D. 1983. Nitroguanidine Wastewater Pollution Control Technology: Phase I Report. MR 3-83.

Burrows, E.P., E.E. Bruggemann, E.H. MacNamee, L.J. Baxter, and S.H. Hoke. 1984. Nitroguanidine Wastewater Pollution Control Technology: Phase II. Characterization and Analytical Methods Development. Technical Report 8311, AD A141176.

Noss, C.I. and R.H. Chyrek. 1984. Nitroguanidine Wastewater Pollution Control Technology: Phase III. Treatment with Ultraviolet Radiation, Ozone, and Hydrogen Peroxide. Technical Report 8309, AD A139389.

Small, M.J. 1984. Nitroguanidine Wastewater Pollution Control Technology: Phase III. Ion Exchange and Carbon Adsorption Treatment. Technical Report 8310, AD A141176.

FY84 DETAIL SHEET

TITLE: (U) Screening of Military-Relevant Chemicals for Toxicity to Aquatic Organisms

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	264	2.4
	CURRENT	206	2.5
	PROJECTED	212	2.5

MILITARY RELEVANCE: Aquatic toxicology data are used as part of environmental hazard assessements for Army-relevant materials. These data are also used to support pollutant discharge standards for Army Ammunition Plants and other Army facilities.

MAJOR ACHIEVEMENTS: Aquatic toxicity data relevant to the production of nitroguanidine at Sunflower Army Ammuntion Plant (SAAP) were generated. The toxicity of nitroguanidine to 10 species of freshwater aquatic organisms and the effect of photolysis on toxicity was determined. Fathead minnow early life stage and daphnid chronic toxicity tests were done with guanidine nitrate, which is also found in waste effluents at SAAP.

PUBLICATIONS/PRESENTATIONS:

van der Schalie, W.H. In Press. The Toxicity of Nitroguanidine and Photolyzed Nitroguanidine to Freshwater Aquatic Organisms. Technical Report 8404.

van der Schalie, W.H., P.H. Gibbs, and T.R. Shedd. Toxic Interactions of 1,3,5-Trinitrobenzene and 3,5-Dinitroaniline in Acute and Chronic Toxicity Tests with the Aquatic Invertebrate Daphnia magna. Technical Report 8403. (DRAFT).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 0B 6188	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	123 APC F691
b. CONTRIBUTING				
c. ~~CONTRIBUTING~~	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Screening of Military-Relevant Chemicals for Toxicity to Aquatic Organisms

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
76 10	CONT	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER		84	2.5	206
c. TYPE	d. AMOUNT	85	2.5	212
e. KIND OF AWARD	f. CUM/TOTAL			

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR van der Schalie, W H
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Lab Animals; (U) Munitions; (U) Fish (U) Aquatic Toxicology; (U) Hazardous Wastes; (U) Pesticides; (U) RAM III

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To provide aquatic toxicity data required in conjunction with in-house and extramural research related to Army activities. These data will help assess the hazard to aquatic organisms of Army-relevant materials and aid in the pollution abatement process and compliance at Army facilities.

24. (U) To conduct aquatic toxicity testing through comparative screening tests and through generation of toxicity data; to evaluate state-of-the-art toxicity testing methods to determine applicability to research requirements; to advance the state-of-the-art in toxicity testing methods where research requirements cannot be met with existing methods.

25. (U) 8310 - 8409. Testing was completed with nitroguanidine and photolyzed nitroguanidine. Nitroguanidine toxicity to the organisms tested (four fish, five invertebrates, and one algal species) occurred at concentrations of 1,500 mg/L or more. Photolysis greatly increased toxicity; acutely toxic levels of photolyzed nitroguanidine (expressed as original nitroguanidine concentrations) were 30-40 mg/L. Fish early life stage and daphnid chronic tests were completed with guanidine nitrate. Published report is:

van der Schalie, W.H. 1983. The Acute and Chronic Toxicity of 3,5-Dinitroaniline, 1,3-Dinitrobenzene, and 1,3,5-Trinitrobenzene to Freshwater Aquatic Organisms. Technical Report 8305, AD A138408.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
				DAOG9320	84 10 01	DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISP'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
83 10 01	D. CHANGE	U	U		DX	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63732A	3S463732D836	BB	008 APC F311
b. CONTRIBUTING			BA	
c. CXXXXXXXXG	CARDS NO: 1419R			

11. TITLE *(Precede with Security Classification Code)*

(U) Ethylene Oxide Sterilization (EOS) System

12. SUBJECT AREAS

0612 Medical and hospital equipment; 0613 Microbiology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 12	85 09	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE	EXPIRATION
b. CONTRACT/GRANT NUMBER	
c. TYPE	d. AMOUNT
e. KIND OF AWARD	f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.8	40
1985	0.8	42

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Prensky, W C
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Salisbury, L L g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Gaseous Sterilization; (U) Aeration; (U) Residues; (U) Toxic; (U) Leak Detector; (U) RAM II

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Conduct an engineering evaluation of the ethylene oxide sterilization system developed for field Army medical use.

24. (U) Evaluate OT II report, make necessary modifications, and prepare Technical Data Package prior to type classification.

25. (U) (8310-8409) Operational testing (OT II) was completed in April 1984, and the report was received in August 1984. The Technical Data Package is being prepared.

DD FORM 1498 83 MAR

EDITION OF MAR 68 IS OBSOLETE.

U.S. G.P.O. 1984-421-646/17001

FY1984 DETAIL SHEET

TITLE: (U) Ethylene Oxide Sterilization (EOS) System

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	115	3.5
	CURRENT	40	0.8
	PROJECTED	42	0.8

MILITARY RELEVANCE: No reliable field sterilization system exists for the preparation of reusable heat-labile medical equipment. Large quantities of such goods are already in field hospitals, and there is a growing realization of the need to reuse some plastic and rubber goods intended for one-time use. Ethylene oxide is the overwhelming choice for sterilization of heat-labile goods.

MAJOR ACHIEVEMENTS: A contract was awarded in 1979 for the design of an Ethylene Oxide Sterilization System and an aerator. More than a year of additional development engineering was performed at USAMBRDL culminating in Development Test II. Operational Test II was completed at Fort Belvoir, VA, in April 1984. An In-Process Review is expected in 2nd Quarter FY 85.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA302424	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY H.TERMINATION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63732A	3S463732D836	BB	009 APC F314
b. CONTRIBUTING				
c. [illegible]G	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Medical Element, Mobile

12. SUBJECT AREAS 0612 Medical and hospital equipment; 0607 Escape, rescue, and survival; 0611 Life support

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 04	85 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.1	8
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR O'Connor, R J
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Conway, W H g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Aid Station; (U) Mobile Aid Station; (U) Trailer Mounted Aid Station; (U) Mobile Medical Element; (U) Field Medical Station;

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*
(U) RAM II

23. (U) Provide a protected environment for emergency medical treatment in a military mobile trailer mounted facility.

24. (U) Lists of equipment and supplies that constitute the battalion aid station have been assembled. The weight and volume of the supplies and equipment, as well as weight and volume of a trailer mounted enclosure, electrical generation capability, air handling equipment for chemical protection, panels for ballistic protection, and internal storage facilities, will be studied to provide an optimum configuration which meets the requirement of the proposed Letter of Agreement (LOA). Preliminary design of a mobile medical element will be initiated.

25. (U) (8310-8409) Work on the proposed LOA has been suspended pending the outcome of the US Army Natick Research and Development Center's project on the chemically hardened shelter.

FY1984 DETAIL SHEET

TITLE: (U) Medical Element, Mobile

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	26	0.3
	CURRENT	8	0.1
	PROJECTED	0	0.0

MILITARY RELEVANCE: The predicted fluidity of the European battlefield and the projected mode of operation of the light division in that arena dictate the need for a highly mobile forward medical treatment facility. In addition to ready mobility, the facility will require sufficient armor to afford small arms protection to personnel and a means of dealing with chemical attack.

MAJOR ACHIEVEMENTS: A four-ton, four-wheel military design trailer (M794) has been identified for carrying the Medical Element, Mobile (MEM). A preliminary layout of cabinets, enclosures, storage areas, etc., has been prepared. Manufacturers of various kinds of ballistic protective materials have been contacted. Data bases of the supplies and equipment used in the battalion aid station have been secured. Activity on the MEM has been suspended pending the results of the development effort on the chemically hardened shelter by the US Army Natick Research and Development Center.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG9210	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63732A	3S463732D836	BB	010 APC F316
b. CONTRIBUTING	62772A	3S162772A874	BA	223
c. CONTRIBUTING	CARDS NO. 1423A			

11. TITLE *(Precede with Security Classification Code)*
(U) On-Site Medical Oxygen Generating and Distribution System

12. SUBJECT AREAS
0602 Bioengineering; 0611 Life support; 0612 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 01	86 09	DA	C. In-House

17. CONTRACT/GRANT
a. DATE EFFECTIVE | EXPIRATION
b. CONTRACT/GRANT NUMBER
c. TYPE | d. AMOUNT
e. KIND OF AWARD | f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.1	12
1985	0.1	13

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Prensky, W C
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Medical Gases; (U) Field Gas Generation; (U) Life Support; (U) Hospital Equipment; (U) RAM II

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop the concept and requirements for generation of medical gases (principally oxygen) in the field, thus negating the need for moving large numbers of high pressure gas bottles through the supply system to forward areas.

24. (U) Commence development work after contract has been awarded.

25. (U) (8310-8409) A Source Selection Board met in June 1984 and examined six proposals; three were selected for further consideration.

FY1984 DETAIL SHEET

TITLE: (U) On-Site Medical Oxygen Generating and Distribution System

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	75	0.7
	CURRENT	12	0.1
	PROJECTED	13	0.1

MILITARY RELEVANCE: The need for medical oxygen presents a logistical problem of large magnitude. The transport of large numbers of high pressure gas cylinders directly conflicts with the need to move other combat hardware and may not be possible when combat operations are under way. On-site oxygen production will alleviate the logistical conflict and may be the only way to ensure an adequate supply for treatment of combat casualties.

MAJOR ACHIEVEMENTS: A survey of industry was made to determine state-of-the-art technology, and a statement of work was prepared prior to soliciting industry. A Source Selection Board met in June 1984 and selected three candidate contractors for further evaluation.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY	1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
	DAOG9206	84 10 01	DD-DR&E(AR) 636

3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
83 10 01	D. CHANGE	U	U		DX	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63732A	3S463732D836	BB	011 APC F317
b. CONTRIBUTING	62772A	3S162772A874	BA	226
c. C[redacted]G	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Resuscitation Fluids Production and Reconstitution System

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0605 Clinical medicine

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 10	CONT	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE	EXPIRATION
b. CONTRACT/GRANT NUMBER	
c. TYPE	d. AMOUNT
e. KIND OF AWARD	f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.6	27
1985	0.6	30

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Reams, W H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Pyrogen-free Water; (U) Injectables; (U) Reconstitution; (U) Clinical Medicine; (U) RAM II

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Supply pyrogen-free water for use in injectable, intravenous, and other field medical applications. The logistics of military use preclude the shipment of prepackaged water for injection due to size and weight.

24. (U) Investigate various commercial and laboratory methods for the production of sterile pyrogen-free water. Methods of coupling the output of the system to suitable containers for distribution will be examined.

25. (U) (8310-8409) A Request for Proposal for a complete system is being staffed.

FY1984 DETAIL SHEET

TITLE: (U) Resuscitation Fluids Production and Reconstitution System

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	185	2.6
	CURRENT	27	0.6
	PROJECTED	30	0.6

MILITARY RELEVANCE: The availability of pyrogen-free water in a combat area for reconstituting blood substitutes and injectables as well as the lavage of wounds is extremely important. Currently, pyrogen-free water must be obtained from commercial sources and shipped into combat areas. The logistics of military use preclude the shipment of prepackaged fluids. This logistical burden could be eliminated or greatly reduced if pyrogen-free water could be produced on site.

MAJOR ACHIEVEMENTS: A prototype system was assembled, and the components were optimized. Sterile docking methods and an on-line limulus amebocyte lysate (LAL) test apparatus were also investigated. A Request for Proposal for a complete system is being coordinated for joint development by the Army, Navy, and Air Force.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0B6250	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63732A	3S463732D836	BA	012 APC F318
b. CONTRIBUTING	64717A	3S464717D832		042
c. CONTRIBUTING	CARDS NO. 1425R			

11. TITLE *(Precede with Security Classification Code)*
(U) High Capacity Radiographic System for Field Use

12. SUBJECT AREAS
0605 Clinical medicine; 0612 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
79 02	87 07	DA	C. In-House

17. CONTRACT/GRANT
a. DATE EFFECTIVE — EXPIRATION
b. CONTRACT/GRANT NUMBER
c. TYPE — d. AMOUNT
e. KIND OF AWARD — f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.3	12
1985	0.2	13

19. RESPONSIBLE DOD ORGANIZATION

a. NAME: US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)*: Fort Detrick, Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL: Pedersen, C E
d. TELEPHONE NUMBER *(include area code)*: 301-663-7685

20. PERFORMING ORGANIZATION

a. NAME: US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS: Fort Detrick, Frederick, MD 21701-5010
c. NAME OF PRINCIPAL INVESTIGATOR: O'Connor, R J
d. TELEPHONE NUMBER *(include area code)*: 301-663-7527
f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*: Salisbury, L L
g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY/CIVILIAN APPLICATION: L

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) X-Ray; (U) Field Medicine; (U) Field Equipment; (U) Radiology; (U) RAM II

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Identify and evaluate a replacement field X-ray system for the current military standard (100 mA and 200 mA) system which is inadequate in reliability, availability, and maintainability.

24. (U) Search existing commercial sources for functional components (X-ray source, table, power supplies, film processors) that can be adopted. If none are available, modify, design, or contract for design of new devices.

25. (U) (8310-8409) A contract was negotiated and signed for the development of a military, transportable, field radiographic and fluoroscopic system. The contractor has begun work, and six prototypes are scheduled for delivery in November 1985.

U.S. G.P.O. 1984-421-646/17001

FY1984 DETAIL SHEET

TITLE: (U) High Capacity Radiographic System for Field Use

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	62	1.0
	CURRENT	12	0.3
	PROJECTED	13	0.2

MILITARY RELEVANCE: The lack of a working, reliable, certifiable, high capacity X-ray system to meet the radiological requirements of military field medical treatment facilities has a significant impact on the ability of these activities to provide basic health care. The need is critical.

MAJOR ACHIEVEMENTS: A survey was initiated, and it was determined that no commercial system would meet the letter requirement. Commercially available components were obtained and were adapted and modified into a radiological system compatible with field requirements. This system was composed of a commercial control unit, transformer, X-ray source, and image intensifier system. These items were matched to the Army 5090 field table. Film processing was provided by using a commercial wet processor with a daylight loader and a water recycling system. The system underwent operational testing during the 1st Quarter FY 81. Of the 16 critical issues, 10 were satisfied fully and 4 partially. Two issues were unresolved. After limited testing of the system in August 1982, a decision was made to negotiate a contract for the development and production of the high capacity radiographic system. A comprehensive work statement was prepared, and the Request for Quotation was published. Picker International was awarded the contract for the development of the military, field transportable, radiographic and fluoroscopic system. Work began on 1 July 1984. Six prototype systems are scheduled for delivery in November 1985.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG8679	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV S JM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62770A	3M162770A870	BB	261 APC F901
b. CONTRIBUTING			CB	
c. CONTRIBUTING	STOG 82/83-6,2/3			

11. TITLE *(Precede with Security Classification Code)*
(U) Vector Control Methods, Material, Equipment

12. SUBJECT AREAS
0603 Biology; 0612 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 10	85 09	DA	C. In-House

17. CONTRACT/GRANT
a. DATE EFFECTIVE — EXPIRATION
b. CONTRACT/GRANT NUMBER
c. TYPE — d. AMOUNT
e. KIND OF AWARD — f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.3	18
1985	0.4	22

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Nelson, J H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY CIVILIAN APPLICATION H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Buescher, M D g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Vector Control; (U) Equipment; (U) Methodology; (U) Surveillance; (U) RAM I

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop threat projections, technological forecasts, and interagency planning to determine operational capabilities, doctrine, organization, and potential systems to meet Army vector control needs.

24. (U) Investigate and analyze pertinent studies on vector control systems and develop and evaluate experimental and commercial hardware and control formulations to develop strategies for control of militarily important vectors.

25. (U) (8310-8409) Tests conducted in Panama confirmed that penetration of a double canopy by liquid pesticides can be achieved. The pesticide was delivered by a multicapability, helicopter slung, pesticide dispersal unit at twice the standard rate of application (i.e., 8 ounces per acre). Tests will continue in FY 85 in the Philippines to ascertain control of Aedes aegypti in "Hemorrhagic Fever" outbreaks.

FY1984 DETAIL SHEET

TITLE: (U) Vector Control Methods, Material, Equipment

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	52	0.9
	CURRENT	18	0.3
	PROJECTED	22	0.4

MILITARY RELEVANCE: Development of threat projections, technological forecasts, and extensive interagency planning to determine operational capability, doctrine, organization, and potential systems is essential to meet the needs of the Army. The basis for future investigations must be established, and concept formulation must be initiated through early on studies of vector control systems development and evaluation of experimental and commercial hardware. Identification and resolution of technical issues, operational issues, and logistical support problems are critical to the timely incorporation of new methodology, materials, and equipment into the Army's vector control program.

MAJOR ACHIEVEMENTS: Pertinent studies on vector control systems, development and evaluation of experimental and commercial hardware, and control formulations are continually being analyzed and investigated to develop strategies for control of vectors of military importance. The first operational evaluation of the aerial pesticide dispersal unit with solid and liquid dispersal capability was conducted in California for disease vector control against Culex tarsalis and Anopheles freeborni. Results indicated that good control of these vectors in different habitats was possible using Baygon wettable powder and technical grade malathion. Similarly, a test was conducted in Ar zona against Cx. tarsalis using Abate granules as a larvacide.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0B6244	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62770A	3M162770A870	BB	262 APC F902
b. CONTRIBUTING			CB	
c. COORDINATING	STOG 82/83-6.2/3			

11. TITLE *(Precede with Security Classification Code)*
(U) Integrated Pest Management - Black Flies

12. SUBJECT AREAS
0606 Environmental biology; 0603 Biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
78 10	CONT	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE	EXPIRATION
b. CONTRACT/GRANT NUMBER	
c. TYPE	d. AMOUNT
e. KIND OF AWARD	f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.2	13
1985	0.2	14

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Vorgetts, L J
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY CIVILIAN APPLICATION H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Nelson, J H g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Integrated Pest Management (IPM); (U) Biological Control; (U) Black Flies; (U) Disease Vector Control; (U) RAM I

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop methods of long-term suppression of immature stages of black flies and short-term suppression of adults without adverse effect on the environment. Currently, black flies seasonally restrict use of vast military training areas at several CONUS installations. Overseas, they are the primary vector of onchocerciasis or river blindness, a disease of military importance in parts of Africa and Central and South America. Effective vector control strategies will permit increased military training at the affected installations and will reduce the potential threat of casualties due to onchocerciasis.

24. (U) Growth and development regulating hormones or their synthetic chemical analogues will be tested in the laboratory and field aquatic habitat. Formulations designed to attach to specific substrates and with release slowly to provide long lasting control will be evaluated. Attention will also be directed to the use of biological control agents including pathogenic bacteria and fungi. Improvement of standardized methods for making evaluations of such agents will be emphasized because present methodology does not provide results which can be utilized in interlaboratory comparisons. The use of diluents to improve the activity of adulticides will be studied as a possible approach for suppression of adult black flies.

25. (U) (8310-8409) Requirements for testing larvicides with delayed or long-term activity (e.g., juvenile hormone analogues, controlled release pesticide formulations) were delineated. Methods for meeting these requirements were outlined and developed. An improved static bioassay test system was designed for toxicity testing. A new static replacement bioassay system was designed. A flow-through system for rearing black fly larvae and testing larval control strategies was also designed.

FY1984 DETAIL SHEET

TITLE: (U) Integrated Pest Management - Black Flies

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	63	1.4
	CURRENT	13	0.2
	PROJECTED	14	0.2

MILITARY RELEVANCE: Black flies occur in extremely large numbers at some military installations and sites of military operations. Black fly bites lower morale, induce severe allergic reactions, and are susceptible to secondary infections. In Africa and Central and South America, black flies are vectors of onchocerciasis or river blindness, which ranks as one of the five major diseases in the world.

MAJOR ACHIEVEMENTS: Laboratory trials confirmed efficacy of Bacillus thuringiensis var. israelensis (Bti) against larval black fly species. Successful field trials were conducted which demonstrated that Bti can effectively reduce larval populations by 80 percent at 1/4 mile downstream from the application point for a week or longer. Control effectiveness was determined not to be disrupted by stream flow characteristics or dense vegetation, and larval mortality was found to be dose-time dependent. Nontarget organisms were found not to be affected by Bti applications. Requirements for testing larvicides with delayed or long-term activity (e.g., juvenile hormone analogues, controlled release pesticide formulations) were delineated. Methods for meeting these requirements were outlined and developed. An improved static bioassay test system for toxicity testing and a new static replacement bioassay system were designed. A flow-through system for rearing black fly larvae and testing larval control strategies was also designed.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
				DA0A6296	84 10 01	DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
83 10 01	D. CHANGE	U	U		BT	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62770A	3M162770A870	BB	264 APC F904
b. CONTRIBUTING			CB	
c. CONTRIBUTING	CARDS NO. 1406A			

11. TITLE *(Precede with Security Classification Code)*

(U) Technical Feasibility Testing (TFT) of Vector Control Equipment

12. SUBJECT AREAS

0612 Medical and hospital equipment; 0606 Environmental biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
75 03	CONT	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.3	17
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.3	20

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Anderson, L M
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Insect Control; (U) Pesticide Dispersal; (U) Engineer Tests; (U) Ultra-Low Volume (ULV); (U) Skid Mounted Sprayer; (U) RAM I

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Determine the durability of commercially available ultra-low volume (ULV) and powered pesticide dispersal equipment by comparative type engineering tests. Units will be used by military medical and engineering personnel to control mosquitoes and other insect pests. Results will provide user agencies with comparative durability and reliability data which can be used to insure purchase of the most effective equipment available.

24. (U) Determine the operational capabilities of skid-mounted and special-purpose ULV Pesticide dispersal equipment by quantitative and qualitative methods. Measurable quantitative parameters include particle size determination and maintenance of desired pressure and flow rate. General engineering design observations will include corrosive effect of pesticide used during tests; verification of manufacturers' claims of performance specifications; general durability definitions as applied to mean time between breakdown and maintenance time; gas and oil consumption; and definition of high mortality repair parts.

25. (U) (8310-8409) First article tests of the Hudson 1-gallon and 2-gallon sprayers, Curtis-Dyna hand-held ULV sprayer, and Halaby Inc. hand-held ULV sprayer have been completed. Reliability testing of the Micro-Gen G-4 sprayer has been completed.

FY1984 DETAIL SHEET

TITLE: (U) Technical Feasibility Testing (TFT) of Vector Control Equipment

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	23	0.4
	CURRENT	17	0.3
	PROJECTED	20	0.3

MILITARY RELEVANCE: New and improved commercial items are frequently presented to the DOD as potential standard items. Most of these are suitable for DOD use. Others are unfit and should not be procured. Centralized, uniform testing of these items on a request basis is essential to maintain state-of-the-art technology in pest control and to keep from wasting tax dollars on unacceptable equipment.

MAJOR ACHIEVEMENTS: Evaluations of the Micro-Gen CCG-1, M-16, and Bolt E-10 sprayers resulted in information that was used to justify bringing these units of equipment into the Federal supply system. Two portable, ultra-low volume (ULV) sprayers, Micron ULVA and Mini ULVA, were evaluated; but these two units were unacceptable because of pesticide exposure to operating personnel and considerable variation in droplet sizes. First article tests of the Hudson 1-gallon and 2-gallon sprayers, Curtis-Dyna hand-held ULV sprayer, and Halaby Inc. hand-held ULV sprayer have been completed. Reliability testing of the Micro-Gen G-4 sprayer has been completed.

PUBLICATIONS/PRESENTATIONS: Gula, Jr., Philip R., Shankle, James E., and Toms, Jr., Glenn E.; First Article Test of One Gallon Sprayer, Insecticide, Manually-Carried Hand-Operated-Compression; MR 2-84, January 1984.

Gula, Jr., Philip R., Shankle, James E., and Toms, Jr., Glenn E.; First Article Test of Two Gallon Sprayer, Insecticide, Manually-Carried Hand-Operated-Compression; MR 5-84, March 1984.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0B6058	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62770A	3M162770A870	BB	265 APC F905
b. CONTRIBUTING			CB	
c. [redacted]G	CARDS NO. 1410A			

11. TITLE *(Precede with Security Classification Code)*
(U) Pesticide Dispersal Evaluation Set

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0606 Environmental biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
75 04	85 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.2	9
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.2	11

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Boobar, L R
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Nelson, J H g. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Anderson, L M

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Pesticide Dispersal; (U) Droplet Size; (U) Hot Wire Technology; (U) Insect Control; (U) EPA Requirements; (U) RAM I

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop a pesticide field evaluation set capable of measuring ultra-low volume (ULV) droplet size and total pesticide amounts applied by military dispersal equipment utilized in insect control operations.

24. (U) Newly developed technology involving a "hot wire" probe as a serving element for generating counts and discriminating between droplets of various sizes will be interfaced with accessories to increase the equipment's field measurement versatility.

25. (U) (8310-8409) A printer has been successfully interfaced with the droplet measuring device. Design of two methods for increasing droplet/probe contact under field conditions is in progress.

FY1984 DETAIL SHEET

TITLE: (U) Pesticide Dispersal Evaluation Set

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	32	0.8
	CURRENT	9	0.2
	PROJECTED	11	0.2

MILITARY RELEVANCE: Accurate calibration of dispersal equipment is essential for the effective and economical usage of ultra-low volume (ULV) pesticide formulations to provide protection for the soldier from disease vectors and pest arthropods. The dissemination of droplets that are too large for effective control can produce adverse environmental effects.

MAJOR ACHIEVEMENTS: An optical imaging aerosol droplet sizing spectrometer has been secured and has been calibrated. A ground aspirator which produces a constant speed airflow past the sampling region of the spectrometer has been secured. The aspirator provided isokinetic conditions at the sampling region and enabled the data processing system of the spectrometer to provide aerosol concentration information. Various nonvolatile droplet aerosols were dispersed, and information on their size distribution and propagation was gathered.

A Defense Small Business Advanced Technology Program contract was completed by KLD Associates to develop and refine the "hot wire device" for characterization of liquid aerosol particles. As the monitor for this contract, USAMBRDL personnel completed several comparative studies with this device and the slide-wave method of aerosol droplet collection. A phase II contract was awarded to KLD Associates and will involve the design and production of a durable prototype evaluation set suitable for military use.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0G0649	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BT	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62770A	3M162770A870	BB	266 APC F906
b. CONTRIBUTING			CB	
c. [redacted]	CARDS NO. 1405A			

11. TITLE *(Precede with Security Classification Code)*
(U) Integrated Pest Management - Mosquitoes

12. SUBJECT AREAS
0606 Environmental biology; 0603 Biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
79 10	85 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	3.7	204
e. KIND OF AWARD	f. CUM/TOTAL	1985	3.7	215

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Vorgetts, L J
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Nelson, J H
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Integrated Pest Management (IPM); (U) Biological Control; (U) Mosquitoes; (U) Disease Vector Control; (U) RAM I

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop methods for mosquito control that integrate physical, chemical, and biological control methods so as to maintain effective control economically without undue damage to the environment. Provide baseline laboratory and field data on the efficacy of various insecticides for control of mosquito larvae from which field application rates and methods will be developed for use by Army preventive medicine units.

24. (U) Define mosquito problems at a US Army installation using previously accumulated data and on-site observations. Propose strategies for control of the problems which integrate physical, chemical, and biological methods. Proposed strategies will be implemented on-site to test the integrated pest management concept as it applies to mosquitoes.

25. (U) (8310-8409) To correct deficiencies in existing test methods, a standardized bioassay was developed for measuring the effectiveness of formulations utilizing Bacillus thuringiensis var. israelensis (Bti) as the active ingredient. A similar effort for standardizing tests of controlled release (Bti) formulations using sedimentation rate as an indicator of activity was developed.

Vorgetts, L. J., Hopps, L. R., Duncan, J. P. "Effect of Mosquito Larval Cadavers on Tests of Microencapsulated Formulations of Bacillus thuringiensis (serotype H-14)." Presentation by L. J. Vorgetts, 17th International Congress of Entomology, Hamburg, West Germany, August 1984.

DD FORM 1498 83 MAR EDITION OF MAR 68 IS OBSOLETE. U.S. G.P.O. 1984-421-646/17001

FY1984 DETAIL SHEET

TITLE: (U) Integrated Pest Management - Mosquitoes

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	172	4.9
	CURRENT	204	3.7
	PROJECTED	215	3.7

MILITARY RELEVANCE: Troop casualties resulting from mosquito-borne diseases in conflicts prior to World War II exceeded combat-related losses. Mosquito-related casualties in conflicts since 1950 have declined because of vigilant control efforts but remain a major threat to the success or failure of combat operations in armed conflicts.

MAJOR ACHIEVEMENTS: Several field studies utilizing formulations of Bacillus thuringiensis var. israelensis (Bti) were conducted. Both wettable powder and flowable suspension formulations were found to be highly effective. The duration of the treatment was short; no residual activity could be detected. Field tests also confirmed the absence of any observable off-target effects. A standardized bioassay was developed for measuring the effectiveness of formulations utilizing Bti as the active ingredient. A similar effort for standardizing tests of controlled-release formulations using sedimentation rate as an indicator of activity was developed. The feasibility of using microencapsulated techniques for Bti was demonstrated. Preliminary results indicate that persistence of Bti can be extended at least three-fold by microencapsulation.

PUBLICATIONS/PRESENTATIONS: Vorgetts, L. J., Hopps, L. R., Duncan, J. P. "Effect of Mosquito Larval Cadavers on Tests of Microencapsulated Formulations of Bacillus thuringiensis (serotype H-14)." Presentation by L. J. Vorgetts, 17th International Congress of Entomology, Hamburg, West Germany, August 1984.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY	1. AGENCY ACCESSION DA303165	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636

3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
84 01 16	D. CHANGE	U	U		BT	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62770A	3M162770A870	BB	267 APC F907
b. CONTRIBUTING	62770A	3M162770A878		267
c. CONTRIBUTING				

11. TITLE *(Precede with Security Classification Code)*
(U) Delousing Outfit

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0606 Environmental biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 10	88 06	DA	C. In-House

17. CONTRACT/GRANT
a. DATE EFFECTIVE — EXPIRATION
b. CONTRACT/GRANT NUMBER
c. TYPE — d. AMOUNT
e. KIND OF AWARD — f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.1	6
1985	0.3	22

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS Fort Detrick, Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Anderson, L M
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7237
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Nelson, J H g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Delouser; (U) Lice; (U) Insecticide Disperal Equipment; (U) RAM I

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop a delousing outfit that is capable of accurately dispensing insecticides used for control of lice. Equipment will be used by military medical and quartermaster personnel for mass delousing operations of both military and civilian personnel.

24. (U) Using standard military and commercial components, develop a delousing outfit that is lighter, less bulky, and possesses a more accurate dispersal system than the existing delousing outfit.

25. (U) (8401-8409) Design of a system, which will be constructed of durable, lightweight materials, with a self-contained or vehicle engine is undergoing a feasibility evaluation. This design will use commercial components to a maximum and incorporate improvements from the recent Product Improvement Program (PIP).

FY1984 DETAIL SHEET

TITLE: (U) Delousing Outfit

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	0	0.0
	CURRENT	6	0.1
	PROJECTED	22	0.3

MILITARY RELEVANCE: Louse-borne disease has historically caused an adverse impact upon the health, morale, and welfare of both military organizations and the civilian populace during periods of armed conflict. The ability to control the vectors of louse-borne disease is of paramount importance to field medical and quartermaster personnel. The existing delousing outfit is marginally adequate for this task but must be replaced to ensure repair parts availability, provide the capability to accurately dispense the new generation of louse control pesticides, and increase the ease of equipment deployability into an area of operations.

MAJOR ACHIEVEMENTS: The Natick Research and Development Center initiated a Product Improvement Program (PIP), funded by the Troop Support and Aviation Materiel Readiness Command, to fabricate an improved gun/nozzle assembly to dispense the newest pediculicides at the proper rates. The PIP item was tested at USAMBRDL, and recommendations were made for additional modifications. The new PIP item is far superior to the original gun-nozzle assembly. A feasibility study was conducted to establish the basis and best technical approach for meeting the military requirement for a power-driven, delousing outfit. This design will use commercial components to a maximum and incorporate improvements from the recent PIP.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0G0652	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62772A	3S162772A874	BA	221 APC F718
b. CONTRIBUTING				
c. [redacted]	CARDS NO. 1462R			

11. TITLE *(Precede with Security Classification Code)*
(U) Refrigerator, Medical, Field

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0617 Protective equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
79 10	87 10	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORK YEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.1	14
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.1	15

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR O'Connor, R J
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* Conway, W H
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Biological Refrigerator; (U) Medical Refrigerator; (U) Biological Storage; (U) Blood Storage; (U) RAM II

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Identify a replacement item for the biological refrigerator that is currently in the military inventory (NSN 4110-00-707-2550) but is no longer supportable.

24. (U) Locate a suitable commercially produced item that will satisfy requirements or that can be made to do so with minor modification. A new development effort will be undertaken if a suitable item is unavailable.

25. (U) (8310-8409) An evaluation of the units was completed with less than satisfactory results. A Request for Proposal was prepared to initiate a development contract for a refrigerator that will meet the Army's requirements.

FY1984 DETAIL SHEET

TITLE: (U) Refrigerator, Medical, Field

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	30	0.2
	CURRENT	14	0.1
	PROJECTED	15	0.1

MILITARY RELEVANCE: A refrigerator for the storage of perishable medical supplies is a necessity for field military units. Special requirements such as the need to store whole blood and the rugged operating environment eliminate many available commercial units from consideration.

MAJOR ACHIEVEMENTS: Two commercial units have been identified that could possibly meet requirements with some modifications. Consideration has also been given to upgrading the current military model to make it supportable. A new thermoelectric model has surfaced that is designed specifically for military use. This unit showed potential for satisfying the requirements. An engineering evaluation was conducted, and the unit partially satisfied the requirements. Two additional units were secured by USAMMA for evaluation by this Laboratory with only partially successful results. A Request for Proposal was published, and a Source Selection Board will select a contractor to build a refrigerator that meets all of the Army's requirements.

PUBLICATIONS/PRESENTATIONS: Hodge, Jr., John W., and Toms, Jr., Glenn E.; Engineering Evaluation of Bilan Refrigerator; Test Report, MR 16-83, November 1983.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG0651	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K.COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62772A	3S162772A874	BA	222 APC F719
b. CONTRIBUTING				
c. COORDINATING	STOG 82/83-6.2/4			

11. TITLE *(Precede with Security Classification Code)*

(U) Sterilizer, Surgical Instrument and Dressing

12. SUBJECT AREAS

0612 Medical and hospital equipment; 0602 Bioengineering

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
79 10	83 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.0	0
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Prensky, W C
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Sterilizer, Field; (U) Sterilizer, Dental; (U) Sterilizer, Veterinary; (U) Sterilizer, Small; (U) RAM II

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Identify a small table-top sterilizer to replace the standard military sterilizers (NSN 6530-00-782-6503, NSN 6530-00-926-4857, and NSN 6530-00-926-2022) which are no longer supportable.

24. (U) Canvas the market for a commercial item that is suitable or requires only minor modification. If this approach should fail, a new development effort may be undertaken.

25. (U) (8310-8409) This task was terminated in FY 83 and is considered complete.

FY1984 DETAIL SHEET

TITLE: (U) Sterilizer, Surgical Instrument and Dressing

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	165	2.0
	CURRENT	0	0.0
	PROJECTED	0	0.0

MILITARY RELEVANCE: This task seeks to identify or develop a small table-top sterilizer specifically suited for use in forward area field military medical treatment units.

MAJOR ACHIEVEMENTS: One commercial, electrically powered unit was evaluated, but the task was stopped due to uncertainty regarding future sterilization requirements at aid station level.

PUBLICATIONS/PRESENTATIONS: None

FY1984 DETAIL SHEET

TITLE: (U) Technical Feasibility Testing of Foreign Medical Materiel for Use in a Contaminated Environment

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	19	0.1
	CURRENT	20	0.4
	PROJECTED	40	0.5

MILITARY RELEVANCE: This task provides a vehicle for evaluating foreign military medical materiel that could be used by US forces in a chemically contaminated environment.

MAJOR ACHIEVEMENTS: An Israeli aid station set and a West German decontamination station equipment set have been procured and are being evaluated for possible adoption in whole or part.

PUBLICATIONS/PRESENTATIONS: Hodge, Jr., John W., and Toms, Jr., Glenn E.; SKEDCO™ Stretcher; Test Report, MR 8-84, May 1984.

Gula, Jr., Philip R., and Toms, Jr., Glenn E.; Comparative Evaluation of the US Army and Israeli Aid Bags; MR 13-84, November 1984.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG1894	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62734A	3M162734A875	CB	224 APC F353
b. CONTRIBUTING			BB	
c. ~~CONTRIBUTING~~	STOG 82/83-6.2/1			

11. TITLE *(Precede with Security Classification Code)* (U) Technical Feasibility Testing of Foreign Medical Materiel for Use in a Contaminated Environment

12. SUBJECT AREAS 1502 Chemical, biological, and radiological warfare; 0612 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
80 01	CONT	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.4	20
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.5	40

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Conway, W H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Chemical; (U) Biological; (U) Nuclear; (U) Field Equipment; (U) Medical Materiel; (U) Evaluation; (U) Casualty Management; (U) Patient Management; (U) Treatment; (U) RAM V

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Evaluate foreign medical materiel/technology/doctrine for AMEDD adoption and use in contaminated field environments. Contaminated environments include nuclear, biological, and chemical warfare. Evaluation and adoption of selected foreign medical materiel/technology/doctrine can rapidly and effectively improve AMEDD's casualty management capabilities.

24. (U) Start evaluation of the Federal Republic of Germany's foreign medical materiel/technology/doctrine for patient handling in a chemical warfare environment.

25. (U) (8310-8409) Reports, equipment, and/or procedures from foreign sources are continually reviewed for potential US Army use. Field decontamination equipment from the Federal Republic of Germany has arrived, and evaluation will be conducted by the US Army Medical Research Institute of Chemical Defense. Additionally, an Israeli aid station set with treatment capability for chemical casualties has been received for evaluation.

FY1984 DETAIL SHEET

TITLE: (U) Technical Feasibility Testing (TFT) of Delivery Systems for Chemical Warfare Medicaments

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	1	0.1
	CURRENT	17	0.3
	PROJECTED	17	0.3

MILITARY RELEVANCE: Simple, reliable delivery systems are essential for the delivery of chemical agent antidotes to troops subjected to chemical warfare agents.

MAJOR ACHIEVEMENTS: Purchase specifications for the 2-PAM Chloride have been reviewed and comments have been forwarded to the task force. Vibration tests on the Mark I coupler were initiated and completed during 4th Quarter FY 82. Drawings and specifications from the contractor on the Mark I, Nerve Agent Antidote Kit, were reviewed and forwarded to USAMRDC. Delivery of prototype devices for field evaluation as well as in-house environmental testing is planned for mid FY 85.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG2702	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISP'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62734A	3M162734A875	CB	223 APC F354
b. CONTRIBUTING			BB	
c. [illegible]G	STOG 82/83-6.2/1			

11. TITLE *(Precede with Security Classification Code)* (U) Technical Feasibility Testing (TFT) of Delivery Systems for Chemical Warfare Medicaments

12. SUBJECT AREAS 1502 Chemical, biological and radiological warfare; 0612 Medical and hospital equipment; 0611 Life support

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
80 05	CONT	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE	EXPIRATION
b. CONTRACT/GRANT NUMBER	
c. TYPE	d. AMOUNT
e. KIND OF AWARD	f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.3	17
1985	0.3	17

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR O'Connor, R J
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Delivery Systems; (U) Injectors; (U) Injection Methods; (U) Automatic Injectors; (U) Chemical Warfare Antidotes; (U) Field Medical Materiel; (U) Chemical Casualty; (U) RAM V

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Evaluate any and all kinds of antidote delivery systems to determine the best method/appliance to contain chemical warfare medicaments.

24. (U) Conduct market research to determine possible methods/appliances. Prototypes will be obtained and evaluated for potential use based on established military requirements.

25. (U) (8310-8409) Delivery of the prototype devices for in-house environmental testing and user evaluation by field units is expected in mid FY 85.

FY1984 DETAIL SHEET

TITLE: (U) Patient Decontamination Apparatus

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	107	1.1
	CURRENT	0	0.0
	PROJECTED	0	0.0

MILITARY RELEVANCE: The use of toxic chemical agents (TCA) on the integrated battlefield will produce large numbers of chemically contaminated patients. Currently, the US Army does not have any equipment to decontaminate chemically contaminated patients. It is important to decontaminate patients quickly to save lives, to reduce effects of TCA, and to prevent contamination of medical personnel.

MAJOR ACHIEVEMENTS: Methods, equipment, and materials used by industry and foreign military organizations were reviewed. Based on these investigations and current doctrine, a breadboard patient decontaminating apparatus using a modified Army litter, a pump, and a water collector was fabricated, and some laboratory tests were conducted. With the agreement of the Combat Developer and the USAMRDC, USAMBRDL has suspended effort on this wet decontamination apparatus. The Combat Developer has decided to pursue other avenues to develop a dry decontamination system.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0G5859	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K.COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62734A	3M162734A875	CB	221 APC F356
b. CONTRIBUTING			BB	
c. [redacted]G	STOG 82/83-6.2/1			

11. TITLE *(Precede with Security Classification Code)*
(U) Patient Decontamination Apparatus

12. SUBJECT AREAS 1502 Chemical, biological and radiological warfare; 0612 Medical and hospital equipment; 0611 Life support

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
80 10	84 07	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.0	0
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Reams, W H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Chemical Warfare; (U) Field Medical Materiel; (U) Patient Decontamination; (U) Decontamination Apparatus; (U) RAM V

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop medical materiel for the decontamination of casualties exposed to chemical warfare agents.

24. (U) Conduct an evaluation of all known methods of decontamination for potential candidates.

25. (U) (8310-8409) The Combat Developer has determined that this method of chemical decontamination may not be viable and that the equipment being developed under this task is therefore not required.

FY1984 DETAIL SHEET

TITLE: (U) Carrier, Litter, Wheeled

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	16	0.2
	CURRENT	337	6.1
	PROJECTED	50	0.8

MILITARY RELEVANCE: A standard Army litter is attached to this device to provide a wheeled "gurney" type of patient conveyance to transport patients between dispersed elements of a field hospital (wards, X-ray, operating room, etc.). This device will reduce by at least 50 percent the number of litter bearers required and also facilitate the use of female soldiers as litter bearers.

MAJOR ACHIEVEMENTS: A test bed was constructed to evaluate various wheel configurations on a standard Army litter while operating on different types of terrain. Also, a West German wheeled litter carrier, which was designed for field military use, was procured and evaluated. This carrier has a number of excellent features but is made of steel and uses Moped tires which provide a narrow footprint. A version of the West German model was produced by USAMBRDL, which includes an aluminum frame and an axel offset that offers more stability over rough terrain. Field tests were conducted in Honduras on both versions. A type classification package is being prepared.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION: DAOG5856	2. DATE OF SUMMARY: 84 10 01	REPORT CONTROL SYMBOL: DD-DR&E(AR) 636
3. DATE PREV SUM'RY: 83 10 01	4. KIND OF SUMMARY: D. CHANGE	5. SUMMARY SCTY: U	6. WORK SECURITY: U	7. REGRADING	8. DISB'N INSTR'N: DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62772A	3S162772A874	BA	236 APC F794
b. CONTRIBUTING				
c. CONTRIBUTING	CARDS NO. 1436R			

11. TITLE *(Precede with Security Classification Code)*

(U) Carrier, Litter, Wheeled

12. SUBJECT AREAS

0612 Medical and hospital equipment; 0607 Escape, rescue, and survival

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
80 09	85 09	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE | EXPIRATION

b. CONTRACT/GRANT NUMBER

c. TYPE | d. AMOUNT

e. KIND OF AWARD | f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	6.1	337
1985	0.8	50

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME: US Army Medical Bioengineering Research & Development Laboratory	a. NAME: US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)*: Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS: Fort Detrick, Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL: Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR: Thayer, C R
d. TELEPHONE NUMBER *(include area code)*: 301-663-7685	d. TELEPHONE NUMBER *(include area code)*: 301-663-7527
21. GENERAL USE: Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*: Conway, W H
MILITARY/CIVILIAN APPLICATION: M	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Mobile Litter; (U) Litter Carrier; (U) Wheeled Litter; (U) Standard Army Litter; (U) RAM II

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop a device that enables a standard Army litter to be converted into a wheeled "Gurney" type of patient conveyance that can be moved over field terrain by one or, at most, two litter bearers. The purpose is to reduce the number of personnel required in field hospitals to move patients and to facilitate the use of female soldiers in the role of litter bearer.

24. (U) Procure and evaluate specimens of foreign equipment that address this need and are known to exist. Failing that, a new development effort will be undertaken.

25. (U) (8310-8409) Engineering development tests and field tests in Honduras have been conducted on both versions. A type classification package is being prepared with the concurrence of the Combat Developer.

FY1984 DETAIL SHEET

TITLE: (U) Tactical Ambulance Adaptation, Feasibility Study of

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	17	0.1
	CURRENT	0	0.0
	PROJECTED	0	0.0

MILITARY RELEVANCE: This task deals with the adaptation of military tactical vehicles as front-line ambulances for use where conventional vehicles cannot go.

MAJOR ACHIEVEMENTS: The M113 armored personnel carrier was identified as the medical treatment/evacuation vehicle of choice. Various internal configurations to enhance treatment capability were studied. In particular, a West German hard-mounted litter rack was evaluated for possible use in the M113. Information generated from these studies has been reported to the Combat Developer.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOB6219	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K.COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62772A	3S162772A874	BA	232 APC F793
b. CONTRIBUTING				
c. [redacted]	STOG 82/83-6.274			

11. TITLE *(Precede with Security Classification Code)*
(U) Tactical Ambulance Adaptation, Feasibility Study of

12. SUBJECT AREAS
0602 Bioengineering; 0612 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
77 05	83 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.0	0
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Conway, W H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Ambulance; (U) Tactical Ambulance; (U) Emergency Medical Vehicle; (U) Medical Transport; (U) RAM II

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Conduct a study of the Army's needs in tactical ambulances and their capabilities in preparation for the next major procurement.

24. (U) Initiate a study program to identify the number and type of vehicles needed, the required medical capabilities of each, and the logistical implications. The results of this study will be a comprehensive requirements document.

25. (U) (8310-8409) This task was terminated in FY 83 and is considered complete.

FY1984 DETAIL SHEET

TITLE: (U) Family of Medical Equipment Protective Containers

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	38	0.3
	CURRENT	26	0.5
	PROJECTED	27	0.5

MILITARY RELEVANCE: Containers are required to protect medical equipment during transport and storage in a battlefield environment.

MAJOR ACHIEVEMENTS: Initially, 14 items were identified for packing. Packaging was designed for each item. This list was increased to 150 pieces by reviewing packing instructions for the following medical areas: intensive care ward, surgical ward, pharmacy, evacuation, medical supplies, combat support hospital medical supplies, ear-nose-throat clinic, patient ward, patient receiving clinic, orthopedic ward, emergency treatment, and oral surgery. Similarity in size of many pieces of equipment allowed this list to be reduced to 54 item sizes. Examination of a computer ordering of these 54 sizes indicated that a family of six containers would efficiently accept each item or combination of items. Further adjustment of container dimensions reduced this number to four sizes of containers. Containers for items that require shock protection will be provided with a shock absorbing system. The same family of four case sizes will also be provided for the storage of bulk items not requiring this shock protection. Information provided by manufacturers of some of the more delicate items was used to determine the level of shock protection required. Containers made by rotationally molding high density polyethylene appear to be the most suitable at this time. The US Army Medical Materiel Development Activity (USAMMDA) has requested that no further effort be expended by USAMBRDL until an In-Process Review can be convened to evaluate status and determine a future course of action.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0B6248	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62772A	3S162772A874	BA	228 APC F713
b. CONTRIBUTING				
c. [redacted]	CARDS NO. 1407A			

11. TITLE *(Precede with Security Classification Code)*

(U) Family of Medical Equipment Protective Containers

12. SUBJECT AREAS

0612 Medical and hospital equipment; 0617 Protective equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
78 12	85 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.5	26
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.5	27

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Reams, W H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Container; (U) Protective Container; (U) Field Chest; (U) Medical Chest; (U) RAM II

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Design a family of strong, lightweight containers for fragile medical equipment that is presently authorized to field medical units. This containerization program will assure that equipment is received in good working order and will also reduce packaging time on the battlefield.

24. (U) Identify physical characteristics of existing items to be protected. Determine similarities and then design a container or containers with various inserts to protect the items during handling, shipping, and storage.

25. (U) (8310-8409) The US Army Medical Materiel Development Activity (USAMMDA) has requested that no further effort be expended by USAMBRDL until an In-Process Review can be convened to evaluate status and determine a future course of action.

FY1984 DETAIL SHEET

TITLE: (U) Digital Radiography

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	75	0.7
	CURRENT	30	0.4
	PROJECTED	32	0.4

MILITARY RELEVANCE: A digital radiographic system will reduce the logistics involved in supporting a conventional film type X-ray system in the field by eliminating film and chemicals, which are time-dependent items, and by eliminating the need for water

MAJOR ACHIEVEMENTS: A 1-inch diameter detector using microchannel technology has been received from the contractor and is being evaluated. This unit provides approximately a nine-line pair per millimeter resolution and a sensitivity of approximately twice the conventional fluoroscopic systems. Evaluations to determine dynamic range and energy sensitivity are continuing. A contract is being negotiated to provide a 10-inch diameter unit for evaluation.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
				DAOG9204	84 10 01	DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
83 10 01	D. CHANGE	U	U		CX	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62772A	3S162772A874	BA	227 APC F732
b. CONTRIBUTING				
c. [redacted]G	STOG 82/83-6.2/4			

11. TITLE *(Precede with Security Classification Code)*
(U) Digital Radiography

12. SUBJECT AREAS
0612 Medical and hospital equipment; 0605 Clinical medicine

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 10	CONT	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	1984	0.4	30
e. KIND OF AWARD	f. CUM/TOTAL	1985	0.4	32

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Salisbury, L L
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) X-Ray System; (U) Digital Radiography; (U) Imaging, Medical; (U) Teleradiography; (U) RAM II

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop a digital radiographic/fluoroscopic system for field use. The elimination of film, film processor, and chemicals will do much to minimize the logistic burden associated with the use of conventional X-ray systems in a military medical environment.

24. (U) Using commercial, modified commercial, and in-house developed subsystems, develop a detector, digital processor, display, and recording system for the acquisition, display, recording, and transmission of radiographic information.

25. (U) (8310-8409) A prototype detector with a 1-inch area has been received and is undergoing evaluation. If this detector proves satisfactory, a full-size unit will be developed.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG1512	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62734A	3M162734A875	CB	226 APC F365
b. CONTRIBUTING				
c. C[redacted]G	CARDS NO. 1425A			

11. TITLE *(Precede with Security Classification Code)*
(U) Resuscitative Device, Individual, Chemical

12. SUBJECT AREAS 1502 Chemical, biological, and radiological warfare; 0612 Medical and hospital equipment; 0611 Life support

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16 PERFORMANCE METHOD
81 05	85 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER		1984	1.3	69
c. TYPE	d. AMOUNT	1985	2.7	150
e. KIND OF AWARD	f. CUM/TOTAL			

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Malek, J W
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7277
21. GENERAL USE Foreign Intelligence Considered MILITARY/CIVILIAN APPLICATION M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Resuscitation; (U) Chemical Warfare Casualty; (U) Field; (U) Medical Materiel; (U) Ventilation; (U) Breathing; (U) RAM V

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Develop a lightweight, compact, manual device to resuscitate chemical warfare casualties, which can be operated by an individual soldier.

24. (U) Design an approach and contract with industry for fabrication of a device; test and evaluate prototypes.

25. (U) (8310-8409) The "Burgin" adapter test models were commercially fabricated and delivered. A contract was awarded to Mine Safety Appliances, Evans City, PA, to design and develop an industrial approach to meet design criteria. Models from this contract are anticipated during 2nd Quarter FY 85.

DD FORM 1498 83 MAR EDITION OF MAR 68 IS OBSOLETE.

U.S. G.P.O. 1984-421-646/17001

FY1984 DETAIL SHEET

TITLE: (U) Resuscitative Device, Individual, Chemical

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	109	1.9
	CURRENT	69	1.3
	PROJECTED	150	2.7

MILITARY RELEVANCE: Providing front-line troops with lightweight, mechanical equipment to assist in reviving and maintaining chemical warfare agent casualties until proper medical assistance can be provided is important.

MAJOR ACHIEVEMENTS: Fabrication of an improved "Burgin" adapter design has been successfully concluded. Design improvements include the capability for attachment to a standard field, collapsible canteen; use of chemical warfare agent and decontaminable resistant material; and development of a compact filter device for attachment to a cricothyroid cannula. Filter devices for use in cricothyroidectomy will be available by the end of this fiscal year. Contractual test models are due early 2nd Quarter FY 85 for evaluation.

PUBLICATIONS/PRESENTATIONS: None

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG1513	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62734A	3M162734A875	CA	227 APC F357
b. CONTRIBUTING			BA	
c. [redacted]	STOG 82/83-6.2/1			

11. TITLE *(Precede with Security Classification Code)*
(U) Chemical Hardening of Medical Field Chests

12. SUBJECT AREAS 1502 Chemical, biological, and radiological warfare; 0612 Medical and hospital equipment; 0617 Protective equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 05	CONT	DA	C. In-House

17. CONTRACT/GRANT
a. DATE EFFECTIVE — EXPIRATION
b. CONTRACT/GRANT NUMBER
c. TYPE — d. AMOUNT
e. KIND OF AWARD — f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	2.2	123
1985	2.4	150

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Patzer, N H
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7527
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Chemical Warfare; (U) Field Medical Materiel; (U) Chemical Hardening; (U) Decontamination; (U) Chemical Agent Protection;

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

(U) RAM V

23. (U) Chemically harden existing and future military field medical materiel for resistance to contamination and decontamination agents.

24. (U) Evaluate materials, methods, designs, and equipment for chemical agent resistance in coordination with the Chemical Research and Development Center, Edgewood, MD; advise Materiel Developer and procuring activities of the results and proper approach.

25. (U) (8310-8409) The scope of this task was reduced to deal exclusively with medical field chests. One hundred experimental prototype gaskets for the medical supply chest were received and are scheduled for test and evaluation in 1st Quarter FY 85. Gaskets will be exposed to chemical agents (CA) and decontaminating agents (DA) and evaluated. Effort on the litter handle will be incorporated under a new chemical warfare field litter project.

FY1984 DETAIL SHEET

TITLE: (U) Chemical Hardening of Medical Field Chests

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	91	1.7
	CURRENT	123	2.2
	PROJECTED	150	2.4

MILITARY RELEVANCE: Army Medical Department (AMEDD) capabilities to achieve its mission on the integrated battlefield depend on the contamination survivability of mission essential materiel. Current AMEDD materiel will not survive contamination by chemical agents and decontamination solutions without loss of reliability, availability, and maintainability (RAM) essential characteristics.

MAJOR ACHIEVEMENTS: One hundred experimental prototype gaskets for the medical supply chest were received from the contractor and are schedu- test and evaluation in 1st Quarter FY 85. Gaskets will be exposed to chemical agents and decontaminating agents and evaluated.

PUBLICATIONS/PRESENTATIONS: Hodge, Jr., John W., Shankle, James E., and Toms, Jr., Glenn E.; Litter Covers, Polypropylene Mesh; Test Report, MR 3-84, January 1984.

Hodge, Jr., John W.; Litter Pole Handle Load-Deflection Test; MR 4-84, February 1984.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 302678	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 03 28	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISP'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62734A	3M162734A875	AM	228 APC F375
b. CONTRIBUTING			BE	
c. ~~CONTRIBUTING~~	STOG 82/83-6.2/1			

11. TITLE *(Precede with Security Classification Code)* (U) Adsorbents for the Recovery, Enrichment, and Transport of Chemical Warfare Agents Found in Water

12. SUBJECT AREAS
15 02 Chemical, Biological, and Radiological Warfare; 07 02 Inorganic Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 05	85 09	DA	C. In-House

17. CONTRACT/GRANT
a. DATE EFFECTIVE | EXPIRATION
b. CONTRACT/GRANT NUMBER
c. TYPE | d. AMOUNT
e. KIND OF AWARD | f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.1	18
85	0.1	19

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL
Pedersen, C E
d. TELEPHONE NUMBER *(include area code)*
301-663-7685

20. PERFORMING ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS
Fort Detrick
Frederick, MD 21701-5010
c. NAME OF PRINCIPAL INVESTIGATOR
Hoke, S H
d. TELEPHONE NUMBER *(include area code)*
301-663-2036
f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
Shih, M
g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY/CIVILIAN APPLICATION: M

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Nerve Agents; (U) Adsorbents; (U) Reversed Phase; (U) Separation; (U) Analysis; (U) RAM V

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objective of this work is to determine the feasibility of using commercially available adsorption cartridges and adsorbents for isolating and concentrating levels of CW agents in water to levels detectable with enzyme test tickets. This has high military relevancy because proposed new drinking water levels for CW agents are below present detection technology.

24. (U) Commercially available adsorption cartridges, packed with different adsorbents will be evaluated for their capacities to extract GA, GB, GD, and VX from water and to release these adsorbates into 1 to 2 mL of eluent. Efficiencies of recoveries and cholinesterase responses will be determined.

25. (U) 8403 - 8409. No progress was made on this work unit because cholinesterase test tickets were not available until August 1984. New testing will begin near the end of September 1984.

FY84 DETAIL SHEET

TITLE: (U) Adsorbents for the Recovery, Enrichment, and Transport of Chemical Warfare Agents Found in Water

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	54	0.3
	CURRENT	18	0.1
	PROJECTED	19	0.1

MILITARY RELEVANCE: Proposed new drinking water levels for chemical warfare (CW) agents are below present detection technology. Therefore, methods for isolating and concentrating CW agents from field water for detection with enzyme test tickets are needed.

MAJOR ACHIEVEMENTS: The CW agents GD and GB have been successfully detected below the 5 ppb level in 50 mL of water using commercially available solid phase extraction cartridges in conjunction with enzyme test tickets.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 302676	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY K. COMPLETION	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62734A	3M162734A875	AM	229 APC F376
b. CONTRIBUTING			BE	
c. [redacted]	STOG 82/83-6.2/1			

11. TITLE *(Precede with Security Classification Code)* (U) Toxicity of Chemical Warfare Agent-Contaminated Water after Treatment with Hypochlorite

12. SUBJECT AREAS
15 02 Chemical, Biological, and Radiological Warfare; 07 03 Organic Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 05	84 09	DA	C. In-House

17. CONTRACT/GRANT
a. DATE EFFECTIVE | EXPIRATION
b. CONTRACT/GRANT NUMBER
c. TYPE | d. AMOUNT
e. KIND OF AWARD | f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.5	33
85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Rosenblatt, D H
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-2014
21. GENERAL USE Foreign Intelligence MILITARY/CIVILIAN APPLICATION Not Applicable M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Toxicity; (U) Detoxification; (U) Chemical Warfare Agents; (U) Hypochlorite; (U) RAM V

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To evaluate literature reports which claim that water contaminated with chemical warfare agents is not detoxified by treatment with hypochlorite. This has high military relevance because of use of hypochlorite to decontaminated field waters.

24. (U) Literature reports in which chemical warfare agents in water have been treated with hypochlorite will be reviewed and evaluated for scientific merit. Where doubt or uncertainty exists, the authors of the reports will be contacted and asked to comment. Recommendations for or against new research will be made as a result of the evaluations.

25. (U) 8310 - 8409. There is one significant unknown area that needs to be addressed with regard to detoxification of chemical agents by hypochlorite. This concerns the course of reaction of hypochlorite with VX, especially when the ratio of hypochlorite to VX is less than 2. Under such conditions, an intermediate of enhanced toxicity appears to form. This work will be continued under contract. The scope of a research project to investigate the reaction has been written, and terms of an agreement to perform the work have been negotiated with the Department of Energy. Assigned contract number is 84PP4858.

FY84 DETAIL SHEET

TITLE: (U) Toxicity of Chemical Warfare Agent-Contaminated Water after Treatment with Hypochlorite

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	2	0.1
	CURRENT	33	0.5
	PROJECTED	0	0.0

MILITARY RELEVANCE: The potential consequences of treatment of agent-contaminated water supplies with hypochlorite during military operations need to be determined, since hypochlorite could decrease or enhance agent toxicity.

MAJOR ACHIEVEMENTS: Literature was surveyed. One crucial study suggested that toxicity of VX may be enhanced under certain circumstances. A scope was written for research on VX reactions with hypochlorite to be carried out under a project order.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 302680	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62734A	3M162734A875	AM	230 APC F377
b. CONTRIBUTING			BE	
c. [redacted]	STOG 82/83-6.2/1			

11. TITLE *(Precede with Security Classification Code)*
(U) Analytical Reference Standards of Hydrolysis Products of Chemical Warfare Agents

12. SUBJECT AREAS 07 03 Organic Chemistry; 07 02 Inorganic Chemistry; 15 02 Chemical, Biological, and Radiological Warfare

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 05	84 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.2	17
e. KIND OF AWARD	f. CUM/TOTAL	85	0.2	18

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Wade, C W R
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-7207
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Chemical Warfare Agents; (U) Chemical Synthesis; (U) Elemental Analyses; (U) Reference Reagents; (U) Nerve Agents; (U) RAM V

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To produce and provide 5- to 10-g samples of highly pure, analyzed batches of the stable hydrolysis products of the chemical warfare agents GA, GB, GD, VX, Mustard, and Lewisite to researchers who need these as reference materials. The use of these materials will increase the reliability of Army inter- and intra-laboratory studies.

24. (U) Literature searches will be used to identify the hydrolysis products and to outline routes of syntheses. If methods are not available, modifications or new procedures will be evaluated. Synthesis of the above described substances will then be performed.

25. (U) 8310 - 8409. Contract-synthesis of some of the phosphonic acids would not be cost effective, primarily because of the small quantities, the difficulty of the syntheses, or uncertainties about yield. Methods have been selected or developed for synthesis of isopropyl methyl, ethyl methyl, pinacolyl methyl, and methyl phosphonic acids, primary and secondary hydrolysis products of GA, GB, GD, and VX. These materials will be synthesized in-house as needed for testing.

FY84 DETAIL SHEET

TITLE: Analytical Reference Standards of Hydrolysis Products of Chemical Warfare Agents

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	46	0.2
	CURRENT	17	0.2
	PROJECTED	18	0.2

MILITARY RELEVANCE: The quality of the analytical data needed by Army water treatment operators, preventive and therapeutic medicine personnel, and researchers can be no better than the available reference materials used to detect, identify and quantify chemical warfare agents. The goal of this project is to provide highly pure, elementally analyzed, and physically characterized stable hydrolysis products of GA, GB, GD, VX, Lewisite, and sulfur mustard. The chemical warfare agents, themselves, are extremely unstable and analytical tests are usually conducted in the hydrolysis.

MAJOR ACHIEVEMENTS: Sodium pinacolyl methylphosphonate, the hydrolysis product of GD, has been synthesized in sufficient quantity to show that the method is practicable. Sodium isopropylmethyl phosphoinate, the hydrolysis product of GB and sodium methylmethylphosphonate, hydrolysis product of GA, have been prepared and purified in approximately 1,000-gram quantities. Each of these salts as well as 2,2'-thiodiethanol, the hydrolysis product of sulfur mustard, have been submitted for elemental analyses. If the analyses are satisfactory, each compound will be characterized by GC/MS, IR, HPLC, and TLC.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 303912	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 03 28	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62734A	3M162734A875	AM	241 APC F384
b. CONTRIBUTING			BE	
c. [redacted] G	STOG 82/83-6.2/1			

11. TITLE *(Precede with Security Classification Code)* (U) Removal of Chemical Warfare Agents from Field Water Supplies by Reverse Osmosis: Development of Test Protocol and Efficacy Testing

12. SUBJECT AREAS
06 09 Hygiene and Sanitation; 07 04 Physical Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 03	85 09	DA	C. In-House

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE	EXPIRATION	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER				
c. TYPE	d. AMOUNT	84	0.3	26
e. KIND OF AWARD	f. CUM/TOTAL	85	0.4	27

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Burrows, W D
d. TELEPHONE NUMBER *(include area code)* (301) 663-7685	d. TELEPHONE NUMBER *(include area code)* (301) 663-7104
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Chemical Warfare Agents; (U) Reverse Osmosis; (U) Field Water Supplies; (U) Bench Tests; (U) RAM V

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objective of this research is to develop a simple, bench-scale procedure for testing the efficacy of reverse osmosis (RO) membranes for removal of chemical agents from water. The test procedure will be used to evaluate RO units in the Army inventory for protection of field water supplies. This research is highly relevant to military needs because of proposed use of ROWPU for production of potable water in the field.

24. (U) A bench-scale RO apparatus will be tested with a variety of membranes and agent surrogates and under various operational parameters. Transmission of surrogate agent through the membrane will be compared with transmission of authentic agent through the same membrane, where such data are available. The best surrogate(s) will be incorporated into a test protocol.

25. (U) 8403 - 8409. Materials have been ordered.

DD FORM 1498 EDITION OF MAR 68 IS OBSOLETE. ☆U.S. G.P.O. 1984-421-646/11001

FY84 DETAIL SHEET

TITLE: (U) Removal of Chemical Warfare Agents from Field Water Supplies by Reverse Osmosis: Development of Test Protocol and Efficacy Testing

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	0	0.0
	CURRENT	26	0.3
	PROJECTED	27	0.4

MILITARY RELEVANCE: This research relates to evaluating the treatment capability of proposed use of the Reverse Osmosis Water Purification Unit (ROWPU) for production of potable water in the field.

MAJOR ACHIEVEMENTS: Test protocol is under development.

PUBLICATIONS/PRESENTATIONS: None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA303504	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 03 06	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62734A	3M162734A875	CB	242 APC F385
b. CONTRIBUTING				
c. [redacted]	STOG 82/83-6.2/1			

11. TITLE *(Precede with Security Classification Code)*
(U) Resuscitator/Ventilator, Gas-Powered, Individual (GPV)

12. SUBJECT AREAS 1502 Chemical, biological, and radiological warfare; 0612 Medical and hospital equipment; 0611 Life support

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 03	88 09	DA	C. In-House

17. CONTRACT/GRANT

a. DATE EFFECTIVE	EXPIRATION
b. CONTRACT/GRANT NUMBER	
c. TYPE	d. AMOUNT
e. KIND OF AWARD	f. CUM/TOTAL

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
1984	0.2	35
1985	2.0	500

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL Pedersen, C E	c. NAME OF PRINCIPAL INVESTIGATOR Malek, J W
d. TELEPHONE NUMBER *(include area code)* 301-663-7685	d. TELEPHONE NUMBER *(include area code)* 301-663-7277
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY-CIVILIAN APPLICATION L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Resuscitator; (U) Ventilator; (U) Chemical Warfare Casualty; (U) Field; (U) Medical Materiel; (U) Ventilation; (U) Breathing;

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*
(U) RAM V

23. (U) Develop a gas-powered resuscitator/ventilator for resuscitating chemical warfare casualties that would be operable by field medical personnel and would reduce continuous manual operation requirements.

24. (U) Using the data and models developed from a previous joint US Air Force/US Army Medical Research and Development Command contract, test and evaluate initial design prototypes from that program to determine compliance with characteristics being established by the Combat Developer.

25. (U) (8403-8409) Test models from a joint USAF/USAMRDC contract were engineering tested by USAMBRDL. Results indicated that one manufacturer's model comes very close to meeting characteristics being established. New contractual requirements are being prepared for procurement action during FY 85.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE. ☆U.S. G.P.O. 1984-421-646/17001

FY1984 DETAIL SHEET

TITLE: (U) Resuscitator/Ventilator, Gas-Powered, Individual (GPV)

FUNDING:	FY	DOLLARS (000)	PROFESSIONAL MAN YEARS
	PRIOR	0	0.0
	CURRENT	35	0.2
	PROJECTED	500	2.0

MILITARY RELEVANCE: Front-line and transport medical personnel need a resuscitator/ventilator to reduce continuous manual operations and that can function independently when attached to various types of ventilating gas sources.

MAJOR ACHIEVEMENTS: Test prototypes from previous contracts have been subjected to engineering evaluation. Comments on a Draft Letter of Agreement have been forwarded to the Academy of Health Sciences.

PUBLICATIONS/PRESENTATIONS: Gula, Jr., Philip R., and Toms, Jr., Glenn E., Developmental Test Report, Puritan-Bennett Gas-Powered Ventilator, MR 9-84, July 1984.

Gula, Jr., Philip R., and Toms, Jr., Glenn E., Developmental Test Report, Mine Safety Appliances Gas-Powered Ventilator, MR 10-84, July 1984.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA303278	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
a. DATE PREV SUM'RY 83 07 15	4. KIND OF SUMMARY C CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	6580HA	3P665804M802	CA	167
b. CONTRIBUTING				
c. CONTRIBUTING	CARDS			

11. TITLE *(Precede with Security Classification Code)*

(U) Rapid Bioassay Monitoring System for Water Quality - Phase 2, Tasks 2-12

12. SUBJECT AREAS

06 10 Industrial (occupational) Medicine; 06 20 Toxicology; 06 09 Hygiene and Sanitation

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16 PERFORMANCE METHOD
84 04	85 08	DA	B Contract

17. CONTRACT GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 04	EXPIRATION 85 08	FISCAL YEARS	a. PROFESSIONAL WORK YEARS	b. FUNDS *(In thousands)*
c. CONTRACT/GRANT NUMBER	DAMD17-84-C-4155			
d. TYPE U	d. AMOUNT -0-	84	2.6	176
e. KIND OF AWARD CON	f. CUM/TOTAL 196266	85	1.5	78

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Wyatt Technology Corporation
b. ADDRESS *(include zip code)* Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS 820 East Haley Street, P.O. Box 3003, Santa Barbara, CA 93130
c. NAME OF RESPONSIBLE INDIVIDUAL SCHAUB, S A	c. NAME OF PRINCIPAL INVESTIGATOR WYATT, P J
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 805-962-2290
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY CIVILIAN APPLICATION H	e. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Toxicity; (U) Bioassay; (U) Potable Water; (U) Bacteria (U) Laser Light Scattering (U) RAD III

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Study will develop, fabricate and test a breadboard Differential Laser Light Scattering (DLS) system to evaluate the field efficacy of the microbiological bioassay monitoring technology for detection of waterborne toxicants at human toxic threshold levels.

24. (U) The DLS concept will be modified for potential army field use considerations. The use of Dual Angle Weighted Nephelometry (DAWN) will be evaluated for improved accuracy and speed in determining microbiological assay strain responses to toxicants. Methods of storing and using bacterial spores and lyophilized vegetation cells for short term field use will also be evaluated. A battery of extensive tests will be performed to further define microbial DLS responses to toxicants and non-toxic chemicals. A batch breadboard DLS system will be engineered, fabricated, and evaluated for its potential field utility as a biotoxicity monitor.

25. (U) 8402 - 8409. Two breadboard DLS units have been designed and fabricated for use in advanced feasibility studies. New toxicity response algorithms have been developed for use of onboard computers with the DAWN approach. A method of preparing Lyophils which contains test organisms and media and which provides cultures for assay within 2 hours after hydration and incubation has been developed. New assay protocols have been established which will be used in dual laboratory toxicity response studies. DLS read heads have been improved and incubator blocs designed.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA305391	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO. CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	65804A	3P665804M802	BA	04
b. CONTRIBUTING				
c. C[redacted]G	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Medical Support - Suction and Infusion Equipment

12 SUBJECT AREAS
06 12 Medical and hospital equipment; 06 02 Bioengineering

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 03	84 10	DA	B. Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 03	EXPIRATION 84 10	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-84-C-4065			
c. TYPE U	d. AMOUNT 0	84	0.6	47
e. KIND OF AWARD CON	f. CUM/TOTAL $ 47,073	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Triangle Research and Development Corp.
b. ADDRESS *(include zip code)* Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS P.O. Box 12696, Research Triangle Park, NC 27709
c. NAME OF RESPONSIBLE INDIVIDUAL Conway, W H	c. NAME OF PRINCIPAL INVESTIGATOR Colvin, D P
d. TELEPHONE NUMBER *(include area code)* 301-663-7527	d. TELEPHONE NUMBER *(include area code)* 929-467-2878
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY/CIVILIAN APPLICATION L	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Aspirator; (U) Suction; (U) Infusion Device; (U) Intravenous; (U) RAM II

23. TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To investigate the concept and produce prototype suction and infusion devices that are gravity independent and powered by nonelectrical sources.

24. (U) Investigate various small mechanical power sources, such as constant force spring motors, etc., for use with these devices.

25. (U) (8403-8409) Several prototype items are being developed. Delivery of the final items is being delayed due to problems with suppliers.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY	1. AGENCY ACCESSION DA 305393	2. DATE OF SUMMARY 84 10 16	REPORT CONTROL SYMBOL DD-DR&E(AR) 636

3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
	A NEW	U	U		CX	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3M161102BS10	CC	341
b. CONTRIBUTING				
c. [illegible]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Extrapolation of Inhaled Particulate Toxicity Data From Experimental Animals to Humans

12. SUBJECT AREAS
06 15 Pharmacology; 06 20 Toxicology; 06 01 Biochemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 08	87 08	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 08	EXPIRATION 85 02	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	84PP4848			
c. TYPE	d. AMOUNT 205375	84	2.5	205
e. KIND OF AWARD	f. CUM/TOTAL 205375	85	1.2	100

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Toxicology Branch, MD-82 Inhalation Toxicology Division
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Health Effects Research Lab USEPA Research Triangle Park, NC 27711
c. NAME OF RESPONSIBLE INDIVIDUAL REDDY, G	c. NAME OF PRINCIPAL INVESTIGATOR HATCH, G E
d. TELEPHONE NUMBER *(include area code)* 301-663-7104	d. TELEPHONE NUMBER *(include area code)* 919-541-2531
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Toxicity; (U) Extrapolation; (U) Human; (U) Animals; (U) Methods Development; (U) RAD III; (U) PO; (U) Rats

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objective of this research is to quantitatively associate species sensitivity or response to the dose of inhaled particulates and to extrapolate these to human effects.

24. (U) Several species of animals will be exposed via inhalation to particulate matter. Pulmonary effects will be estimated from the relative sensitivities of pulmonary tract tissues. Extrapolation of necessity must be from in vivo animals to in vitro humans.

25. (U) None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA302779	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 03 15	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3M161102BS10	AS	045
b. CONTRIBUTING				
c. [redacted]	STOG 82/83-6.2/3			

11. TITLE *(Precede with Security Classification Code)*
(U) Measurement of Droplet Size Distributions in Insecticide and Herbicide Sprays

12 SUBJECT AREAS
06 13 Microbiology; 06 03 Biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 10	85 10	DA	B. Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 01	EXPIRATION 85 10	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-84-C-4026			
c. TYPE U	d. AMOUNT 0	84	1.8	143
e. KIND OF AWARD CON	f. CUM/TOTAL $172,580	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME KLD Associates
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS 300 Broadway Huntington Station, NY 11746
c. NAME OF RESPONSIBLE INDIVIDUAL Nelson, J H	c. NAME OF PRINCIPAL INVESTIGATOR Mahler, D E
d. TELEPHONE NUMBER *(include area code)* 301-663-7237	d. TELEPHONE NUMBER *(include area code)* 516-549-9803
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Insecticides; (U) Herbicides; (U) Vector Control; (U) Aerosols; (U) Droplet Size; (U) RAM I

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The technical objective is to evaluate a hot-wire device to measure the size distribution of liquid droplets in insecticide and herbicide aerosols and develop a prototype instrument under field conditions. There is a military requirement for this research.

24. (U) Newly developed technology involving a hot-wire probe as a serving element for generating counts and discriminating between droplets of various sizes will be utilized to apply and demonstrate the measurement technique using three insecticides.

25. (U) (8401-8409) A printer has been successfully interfaced with the droplet measuring device. Receipt of the final device is expected 2nd Quarter FY 85.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 301895	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 05 07	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISP'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	057
b. CONTRIBUTING				
c. [redacted]NG	STOG 82/83-6.2	2		

11. TITLE *(Precede with Security Classification Code)* (U) Plant Uptake of 2,4,6-Trinitrotoluene TNT), A Model for Polar Organic Compounds

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 20 Toxicology; 06 06 Environmental Biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 10	87 09	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 03 EXPIRATION 85 01

b. CONTRACT/GRANT NUMBER 82II2032

c. TYPE d. AMOUNT -0-

e. KIND OF AWARD CON f. CUM/TOTAL 275000

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	2.5	100
85	2.7	115

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL
GARDNER, H S

d. TELEPHONE NUMBER *(include area code)*
301-663-7104

20. PERFORMING ORGANIZATION

a. NAME Department of the Army Waterways Experiment Station

b. ADDRESS Corps of Engineers (EL)
P.O. Box 631
ATTN: Budget Officer, Vicksburg, MS 39180

c. NAME OF PRINCIPAL INVESTIGATOR
FOLSOM, B L

d. TELEPHONE NUMBER *(include area code)*
601-634-3720

21. GENERAL USE
Foreign Intelligence Not Applicable

MILITARY/CIVILIAN APPLICATION: L

f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Munitions; (U) Plant Uptake; (U) Trinitrotoluene; (U) Polar Organics; (U) RAD III; (U) IAO

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) This study is designed to assess and subsequently model the uptake of polar organic compounds (specifically TNT) in vascular terrestrial and marsh plants.

24. (U) Current year funding will address the precision and accuracy of the analytical technique used to measure TNT and metabolites in hydroponically exposed plants and TNT uptake rate study in Cypecus esculentus. In addition, plants will be grown in contaminated soil and the uptake of TNT will be assessed.

25. (U) 8403 - 8409. Final Report entitled "Toxicity, Uptake, Translocation, and Metabolism of TNT by Plants: Literature Review" was completed. Hydroponic studies have been completed as have preliminary terrestrial plant studies. P & A studies are complete and interim report is in preparation.

DD FORM 93 MA 1498 EDITION OF MAR 68 IS OBSOLETE

U.S. G.P.O. 1984-421-646/17001

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA301798	2. DATE OF SUMMARY 84 10 04	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 04 19	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISP'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	056
b. CONTRIBUTING				
c. XXXXXXXXXX	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Biochemical, Pharmacological, and Tumorigenic Effects of Drinking Water Carcinogens on Fish

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 09	85 08	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 82 09	EXPIRATION 85 08	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	82PP2814			
c. TYPE	d. AMOUNT -0-	84	0.8	50
e. KIND OF AWARD CON	f. CUM/TOTAL 200000	85	0.0	00

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME National Cancer Institute Blair Building
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS 8300 Colesville Road Silver Spring, MD 20910
c. NAME OF RESPONSIBLE INDIVIDUAL KELLY, J A	c. NAME OF PRINCIPAL INVESTIGATOR KRAYBILL, H F
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 301-496-1625
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY/CIVILIAN APPLICATION: H	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Carcinogens; (U) Fish Tumors; (U) Animal Models; (U) Drinking Water; (U) RAD III; (U) Lab Animals; (U) Fish; (U) PO

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) This project is a feasibility study to determine if fish can be used to evaluate potential carcinogens and mutagens on a routine basis. The toxicants selected are 14 drinking water contaminants that may be carcinogenic in mixture or separately. Levels of these contaminants found in drinking water will be included in the tests. Complete pathology and selected biochemical tests will be performed on marine and freshwater fish exposed to drinking water contaminants. This study will determine if fish can be used to detect mutagens/carcinogens in military drinking water supplies.

24. (U) The study will be conducted in phases. Phase I will determine if a mixture of drinking water contaminants is tumorigenic to fish. Phase II will be concerned with a bioassay of two to five components to evaluate synergism or inhibition.

25. (U) 8310 - 8409. Progress for this period included: (1) methods of fish culture were refined; (2) 9 flow-through exposures were completed, (3) substantial histological progress was made with regard to reading of slides and (4) compilation of data from pulse exposures performed during the initial project year.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 301451	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 06 19	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	054
b. CONTRIBUTING				
c. [illegible]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) The Development of a Mathematical Model to Describe the Fate of 2,4,6-Trinitrotoluene (TNT) in a Vascular Aquatic Plant System

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 05	85 07	DA	B Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 02	EXPIRATION 85 07	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-83-C-3166			
c. TYPE S CT	d. AMOUNT -0-	84	1.0	47
e. KIND OF AWARD CON	f. CUM/TOTAL 97061	85	1.0	00

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Tulane University School of Public Health & Tropical Medicine
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Dept. of Environmental Health Sciences 1430 Tulane Avenue New Orleans, LA 70112
c. NAME OF RESPONSIBLE INDIVIDUAL GARDNER, H S	c. NAME OF PRINCIPAL INVESTIGATOR ENGLANDE, A J
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 504-588-5374
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* BARBER, J T
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) TNT; (U) Aquatic Toxicology; (U) Aquatic Plants; (U) Mathematical Models; (U) RAD III

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) This project is part of a larger effort to develop a data base on the toxicity of 2,4,6-trinitrotoluene (TNT) and other munitions-related materials to aquatic organisms. Specifically, this project will determine the toxicity of TNT to an aquatic vascular plant and will attempt to model the dynamics of TNT in plant tissues. The results will be used along with data from other investigations to assess the hazard to aquatic organisms associated with potential discharges of TNT from Army facilities.

24. (U) Aquatic vascular plants will be raised in defined media and exposed to TNT. Availble analytical techniques for determining TNT concentrations in water and plant tissues will be developed and validated. Preliminary tests will address the acute toxicity and uptake of TNT by the plant. If substantial uptake is demonstrated, the kinetics of TNT movement between the plant and the water will be determined, and the application of mathematical models to describe the behavior of the system will be investigated.

25. (U) 8406 - 8409. Literature review, preliminary analytical technique development, equipment purchase and preliminary range-finding toxicity studies have been accomplished. Additional analytical techniques as well a definitive toxicity testing is ongoing.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
				DA0G7065	84 10 01	DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
83 11 15	D CHANGE	U	U		CX	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	049
b. CONTRIBUTING				
c. [redacted]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*

(U) Chemical Analysis of Dursban in Outdoor Experimental Channels

12. SUBJECT AREAS

06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 05	84 12	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 83 12	EXPIRATION 84 12	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	81PP1806			
c. TYPE	d. AMOUNT -0-	84	0.2	00
e. KIND OF AWARD CON	f. CUM/TOTAL 68133	85	0.1	00

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME The College of William and Mary
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Williamsburg, VA 23185
c. NAME OF RESPONSIBLE INDIVIDUAL van der SCHALIE, W H	c. NAME OF PRINCIPAL INVESTIGATOR KIEFER, R L
d. TELEPHONE NUMBER *(include area code)* 301-663-7627	d. TELEPHONE NUMBER *(include area code)*
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY/CIVILIAN APPLICATION: H	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*

(U) Dursban; (U) Pesticides; (U) Aquatic Toxicology; (U) Water Quality; (U) RAD III; (U) PO

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Objective is to provide detailed chemical analyses of the pesticide Dursban in the water, sediments, and biota of stream ecosystem. Other water quality parameters will be analyzed and all data will be used to help determine the fate and transport of this chemical in aquatic systems. Supplemental information on the interactions of Dursban with microbial communities will also be obtained.

24. (U) Samples of water, sediments, and biota will be collected and analyzed onsite. Dursban concentrations will be determined by gas chromatographic techniques following appropriate extraction procedures. Other water quality parameters will be determined using standard methodologies. Field samples will also be used to evaluate the effects of Dursban on microorganisms and the ability of the microorganisms to degrade or transform Dursban.

25. (U) 8311 - 8409. Little progress has been made on the remaining final reports for thi. project. The US Environmental Protection Agency has had difficulty in completing reports on the biological effects and environmental fate modeling studies with Dursban.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 305366	2. DATE OF SUMMARY 84 10 16	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY A NEW	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	046
b. CONTRIBUTING				
c. ~~CONTRIBUTING~~	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Reproductive Evaluation of Potential Toxicants

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 08	88 08	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 08	EXPIRATION 88 08	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	84PP4859			
c. TYPE	d. AMOUNT 106617	84	2.5	107
e. KIND OF AWARD NEW	f. CUM/TOTAL 106617	85	3.0	168

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Develomental Biology Division, MD-72 Health Effects Research Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS USEPA Research Triangle Park, NC 27711
c. NAME OF RESPONSIBLE INDIVIDUAL BAUSUM, H T	c. NAME OF PRINCIPAL INVESTIGATOR LASKEY, J W
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 919-541-4050
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* GRAY, I g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Reproduction; (U) Lab Animals; (U) Rodents; (U) Toxicology; (U) Chemicals; (U) RAD III; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objective of this project is to develop test procedures that will rapidly identify compounds potentially hazardous to the reproductive system. This approach is more cost effective than the multigenerational approach in identifying compounds which need amore complete evaluation, and in eliminating those with no reproductive impact. This will allow for quicker, more cost-effective evaluations of toxic substances which may have reproductive implications to civilian and military personnel.

24. (U) This project will be conducted in two phases. Phase I consists of protocol standardization for Level 1 testing, screening of toxicants. Phase II will involve validation of the screening procedures for Level 1 using other laboratories. Development of level 2 test procedures will also be conducted during the second phase.

25. (U) None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA304825	2. DATE OF SUMMARY 84 08 14	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY A NEW	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	045
b. CONTRIBUTING				
c. XXXXXXXXXX	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*

(U) Computerization of a Preliminary Pollutant Limit Value Concept

12. SUBJECT AREAS

06 20 Toxicology; 07 03 Organic Chemistry; 07 04 Physical Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 09	86 08	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 09	EXPIRATION 85 03	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	84PP4857			
c. TYPE	d. AMOUNT -0-	84	0.8	48
e. KIND OF AWARD NEW	f. CUM/TOTAL 48000	85	1.1	84

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Construction Engineering Research Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS P.O. Box 4005 Champaign, IL 61820
c. NAME OF RESPONSIBLE INDIVIDUAL ROSENBLATT, D H	c. NAME OF PRINCIPAL INVESTIGATOR MESSENGER, M
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 217-352-6511
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*

(U) Pollution; (U) Soil; (U) Groundwater; (U) Chemicals; (U) Criteria; (U) RAD III; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Automate the PPLV calculation methodology to increase the ease of the use and reduce the burden of data processing.

24. (U) Develop an interactive, user-friendly system to accept data inputs from the user and perform necessary PPLV calculations. Establish a protocol for development of data inputs from commercial and public data bases and computerized models and procedures, and network the PPLV calculation program to these data bases or systems.

25. (U) None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA302965	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 07 20	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	044
b. CONTRIBUTING				
c. [redacted]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Collaborative Research Program: Interlaboratory Testing of Aquatic Microcosm Protocol

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 05	85 09	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 83 12	EXPIRATION 85 01
b. CONTRACT/GRANT NUMBER	83PP3811
c. TYPE	d. AMOUNT -0-
e. KIND OF AWARD CON	f. CUM/TOTAL 140000

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	2.4	90
85	2.0	85

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Environmental Impact Section Food & Drug Administration (HFF-27)
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS 200 C Street, SW Washington, DC 20204
c. NAME OF RESPONSIBLE INDIVIDUAL van der SCHALIE, W H	c. NAME OF PRINCIPAL INVESTIGATOR HOFFMAN, B L
d. TELEPHONE NUMBER *(include area code)* 301-663-7627	d. TELEPHONE NUMBER *(include area code)* 202-472-4743
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* MATHESON, J B
MILITARY/CIVILIAN APPLICATION: H	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Aquatic Toxicology; (U) Microcosm; (U) Interlaboratory; (U) Bioassay; (U) RAD III; (U) PD

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The Army has the responsibility for determining the potential hazard to aquatic organisms of materials discharged into surface waters from Army facilities. A major obstacle to accurate predictions of toxic effects is the lack of a standardized, validated test that measures ecosystems-level effects as opposed to effects on individual species of aquatic organisms. This project will subject a previously-developed aquatic microcosm test to interlaboratory testing and evaluation. If proven reliable and reproducible, the microcosm test can be a useful tool for evaluating the toxic impact of materials on aquatic communities. This project is funded under an interagency agreement with the US Food and Drug Administration.

24. (U) Several 63-day microcosm tests utilizing different toxicant materials will be conducted at a number of participating laboratories. The reproducibility of the test and its usefulness in screening for the toxic effects of materials on aquatic organisms will be evaluated.

25. (U) 8311 - 8409. Two 63-day microcosm tests using copper as the toxicant have been completed at the US Environmental Protection Laboratory (EPA) at Duluth, MN. Response trends between the EPA and the University of Washington reference laboratory are similar. Two additional laboratories have agreed to participate in the interlaboratory testing of the microcosm protocol.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
				DA302881	84 10 01	DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
84 02 06	D CHANGE	U	U		CX	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	043
b. CONTRIBUTING				
c. CONTRIBUTING	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*

(U) Environmental Fate of Pentachlorophenol in Outdoor Experimental Channels

12. SUBJECT AREAS

06 06 Environmental Biology; 06 20 Toxicology; 07 03 Organic Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 06	84 12	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE	84 10	EXPIRATION	84 12
b. CONTRACT/GRANT NUMBER	82PP2808		
c. TYPE		d. AMOUNT	-0-
e. KIND OF AWARD	CON	f. CUM/TOTAL	60000

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.2	00
85	0.1	00

19. RESPONSIBLE DOD ORGANIZATION

a. NAME: US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*: Fort Detrick, Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL: van der SCHALIE, W H

d. TELEPHONE NUMBER *(include area code)*: 301-663-7627

20. PERFORMING ORGANIZATION

a. NAME: US Environmental Protection Agency Environmental Research Laboratory-Duluth

b. ADDRESS: 6201 Congdon Boulevard, Duluth, MN 55804

c. NAME OF PRINCIPAL INVESTIGATOR: THOMAS, N A

d. TELEPHONE NUMBER *(include area code)*:

f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*:

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*:

21. GENERAL USE

Foreign Intelligence Not Applicable

MILITARY/CIVILIAN APPLICATION: II

22. KEYWORDS *(Precede EACH with Security Classification Code)*

(U) Pentachlorophenol; (U) Environmental Fate; (U) Aquatic Toxicology; (U) Water Quality; (U) RAD III; (U) PO

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Physical, chemical and biological parameters relating to the fate and transport of pentachlorophenol in outdoor experimental streams will be measured to allow the calibration and validation of several proposed environmental fate models for organic compounds in water.

24. (U) Pentachlorophenol concentrations will be monitored in stream channels dosed with the compound. Processes affecting the fate of pentachlorophenol in stream water such as photolysis, biodegradation, and adsorption to sediments and aquatic organisms will be measured, as will numerous physical and chemical parameters known to influence the fate and transport of chemicals in water. These data will be analyzed using existing environmental fate models to see how well actual pentachlorophenol concentrations in the streams are predicted.

25. (U) 8311 - 8409. Little progress has been made on the remaining final reports for this project. The US Environmental Protection Agency has had difficulty in completing reports on the biological effects and environmental fate modeling studies with pentachlorophenol.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA302452	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 04 19	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	042
b. CONTRIBUTING				
c. CONTRIBUTING	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Histological, Histochemical, and Ultrastructural Characterization of Lesions in Fishes Exposed to Known Carcinogens with Emphasis on Neoplastic Development

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 07	85 07	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 07	EXPIRATION 85 07		
b. CONTRACT/GRANT NUMBER	83PP3813		
c. TYPE	d. AMOUNT -0-		
e. KIND OF AWARD CON	f. CUM/TOTAL 131500		

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.6	54
85	0.5	40

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Environmental Protection Agency Environmental Research Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Sabine Island Gulf Breeze, FL 32561
c. NAME OF RESPONSIBLE INDIVIDUAL KELLY, J A	c. NAME OF PRINCIPAL INVESTIGATOR COUCH, J A
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 904-932-5311
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Carcinogenic; (U) Fish Tumors; (U) Animal Models; (U) Histochemistry; (U) RAD III; (U) Lab Animals; (U) Fish; (U) PO

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To determine if fish, exposed to carcinogens for selected periods during critical life stages, will develop chronic lesions or tumors within 18 months; and to histologically and histochemically characterize these pre-neoplastic and neoplastic lesions in order to abbreviate time-to-endpoint in carcinogen assays. The compound used in this study, N-nitrosodiethylamine, is a waste product of rocket fuel and munition production.

24. (U) Approximately 200 juvenile individuals of each of three species of fish will be exposed to N-nitrosodiethylamine (DEN) for up to 8 weeks. Survivors will be held in clean water for up to 12 months and sampled periodically for histological, histochemical and ultrastructural studies.

25. (U) 8401 - 8409. Progress for this period included: (1) sequence of lesion types in sheepshead minnow; (a) general cytotoxic response (3-8 weeks), (b) clear cell foci, nodular foci and trabeculae (8-14 weeks), (c) hepatocellular and cholangiolar carcinoma, mixed cell hepatocholangiolar carcinoma and hemangiosarcoma (14-28 weeks) and (2) enzyme alterations employed in mammalian liver carcinogenesis studies suggest a progressive pattern of enzyme activity alteration in the development of liver lesions in the sheepshead minnow.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA302451	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 11 15	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E161102BS04	AA	041
b. CONTRIBUTING				
c. XXXXXXXXXX	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Field Assessment of Laboratory-Derived Test Protocols and Water Quality Criterion Modifications with Pentachlorophenol and Ammonia

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology; 07 03 Organic Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 06	84 12	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 10	EXPIRATION 84 12		
b. CONTRACT/GRANT NUMBER	83PP3814		
c. TYPE	d. AMOUNT -0-		
e. KIND OF AWARD CON	f. CUM/TOTAL 30000		

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.2	00
85	0.1	00

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL
van der SCHALIE, W H

d. TELEPHONE NUMBER *(include area code)*
301-663-7627

20. PERFORMING ORGANIZATION

a. NAME US Environmental Protection Agency Environmental Research Laboratory-

b. ADDRESS Dululth
6201 Congdon Boulevard
Duluth, MN 55804

c. NAME OF PRINCIPAL INVESTIGATOR
THOMAS, N A

d. TELEPHONE NUMBER *(include area code)*

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY/CIVILIAN APPLICATION: H

f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Ammonia; (U) Pentachlorophenol; (U) Aquatic Toxicology; (U) Water Quality; (U) RAD III; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The validity of water quality criteria for the protection of aquatic organisms generated from laboratory toxicity tests will be determined by exposing outdoor experimental channels to concentrations of test compounds at, above, and below the water quality criteria levels. The Army has expended considerable resources to generate water quality criteria values for munitions-related materials, so validation of this approach to protecting aquatic resources is important.

24. (U) Two outdoor experimental channels will be dosed with pentachlorophenol, and one will be retained as a control. Biological effects and water quality parameters will be monitored. This study will serve to confirm the previous year's work with pentachlorophenol. A second study, with ammonia, will include generation of site-specific water quality criteria with on-site laboratory toxicity tests, followed by dosing three experimental channels with ammonia, with one channel used as a control. Analysis of the level of biological effects with each compound with respect to the exposure concentrations will provide information on the validity of the current approach recommended by the US Environmental Protection Agency for determining water quality criteria for aquatic organisms.

25. (U) 8311 - 8409. Dosing of the outdoor experimental channels with ammonia has been completed. The US Environmental Protection Agency has had difficulty in completing reports on the biological effects and environmental fate studies with pentachlorophenol.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA300033	2. DATE OF SUMMARY 84 08 08	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 01 03	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	001
b. CONTRIBUTING				
c. [illegible]ING	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Neurotoxicology of Cyclotrimethylenetrinitramine (RDX)

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 09	84 12	DA	D. Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 08	EXPIRATION 84 12		
b. CONTRACT/GRANT NUMBER	82PP2813		
c. TYPE	d. AMOUNT -0-		
e. KIND OF AWARD CON	f. CUM/TOTAL 139000		

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.7	00
84	0.3	45

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL
REDDY, G

d. TELEPHONE NUMBER *(include area code)*
301-663-7104

20. PERFORMING ORGANIZATION

a. NAME Neurotoxicology Division (MD-74B), USEPA Health Effects Research Laboratory

b. ADDRESS
Research Triangle Park, NC 27711

c. NAME OF PRINCIPAL INVESTIGATOR
MACPHAIL, R

d. TELEPHONE NUMBER *(include area code)*
919-541-7734

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY/CIVILIAN APPLICATION: H

f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
REITER, L

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) RDX; (U) Hazard Assessment; (U) Behavioral Toxicology; (U) Environmental Biology; (U) RAD III; (U) Lab Animals; (U) Rats; (U) PO

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objective of thi research is to define the early neurotoxic effects of RDX by a battery of screening tests.

24. (U) The approach to this problem is to measure the behavioral changes induced by single acute exposures and then repeated doses by intubation. The levels of RDX in brain and serum will also be measured in the repeated dosage study.

25. (U) 8401-8408. Preliminary experiments with prototype chemicals on motor activity, flavor aversion conditioned experiments were completed. Acute experiments with RDX on schedule control behavior and conditioned flavor aversion experiments are under progress.

DD FORM 1498 83 MAR EDITION OF MAR 68 IS OBSOLETE. U.S. G.P.O. 1984-421-646/17001

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA302715	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 06 06	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	003
b. CONTRIBUTING				
c. [redacted]	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Methods for Estimating Physicochemical Properties of Inorganic Chemicals of Environmental Concern

12. SUBJECT AREAS
07 02 Inorganic Chemistry; 08 04 Geochemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 09	86 06	DA	B Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 10	EXPIRATION 85 10	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-83-C-3274			
c. TYPE U	d. AMOUNT -0-	84	1.3	137
e. KIND OF AWARD CON	f. CUM/TOTAL 480224	85	2.4	234

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Arthur D. Little, Inc.
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Acorn Park Cambridge, MA 02140
c. NAME OF RESPONSIBLE INDIVIDUAL ROSENBLATT, D H	c. NAME OF PRINCIPAL INVESTIGATOR LYMAN, W J
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 617-864-5770, Ext. 2329
21. GENERAL USE Foreign Intelligence MILITARY/CIVILIAN APPLICATION	e. NAME OF ASSOCIATE INVESTIGATOR *(if available)* BODEK, I
Not Applicable H	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Estimation Methods; (U) Chemical Properties; (U) Inorganic Compounds; (U) Environmental; (U) RAD III

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To compile methods for estimating those physicochemical properties of inorganic and organometallic compounds that are needed in modeling the environmental behavior of such compounds. These methods will help plan military installation restoration.

24. (U) The most useful physicochemical properties will be identified, especially those required in environmental fate predictive models, in hazard ranking systems, and in Federal regulations. Those not amenable to estimation will be eliminated. Methods for estimating the relevant properties will be assembled, and sample problems presented and solved with various possible combinations of initial information. A comprehensive manual will then be assembled in a reasonable and consistent format. The methods described will permit rapid estimation of properties of concern and thereby facilitate studies of the chemicals of concern for such purposes as chemical fate modeling, exposure assessments, priority ranking of lists of chemicals, and process design. The most important references to the literature will be included.

25. (U) 8401 - 8409. Phase I report has been published. Based on the structure of the literature and user needs, the concept for the report was developed and a detailed outline for a methods handbook completed. Phase II, the writing of a handbook, has been started.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA302759	2. DATE OF SUMMARY 84 10 17	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 06 19	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	005
b. CONTRIBUTING				
c. XXXXXXXXXX	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Smoke and Obscurants: A Health and Environmental Effects Data Base Assessment

12. SUBJECT AREAS 19 01 Ammunition, Explosives, and Pyrotechnics; 06 06 Environmental Biology; 06 09 Hygiene and Sanitation

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 10	86 05	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 10	EXPIRATION 85 10		
b. CONTRACT/GRANT NUMBER	83PP3819		
c. TYPE	d. AMOUNT 315800		
e. KIND OF AWARD	f. CUM/TOTAL 605606		

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.1	15
85	3.0	316

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Environmental Sciences Division Lawrence Livermore National Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS P.O. Box 5507 Livermore, CA 94550
c. NAME OF RESPONSIBLE INDIVIDUAL ROSENBLATT, D H	c. NAME OF PRINCIPAL INVESTIGATOR SHINN, J H
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 415-422-6806
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* DANIELS, J I
MILITARY/CIVILIAN APPLICATION: H	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Chemical Hazards; (U) Health Protection; (U) Smokes; (U) Obscurants; (U) Environmental Effects; (U) RAD III; (U) PO

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To assemble and evaluate a body of data on which to base projections and decisions relating to the health effects and environmental impacts of the US Army's current and proposed smokes and obscurants (S&O). S&O include large area visual screening smokes, as well as materials to screen against infrared, microwave and multispectral radiation. The emphasis is on the non-occupational environmental effects of S&O following dispersion.

24. (U) The first phase will consist of preliminary compilation and evaluation of information: formulation of a search strategy; acquisition of documents and other types of information; categorization of S&O and their decomposition products; determination of amounts produced; assessment of the properties of selected chemicals; and formulation of selection criteria for Phase II studies. The second phase will be concerned with thorough data searches and evaluations for selected chemicals.

25. (U) 8401 - 8410. About 1,000 References were collected; performer is still looking at activities.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA302760	2. DATE OF SUMMARY 84 10 17	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 06 19	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	006
b. CONTRIBUTING				
c. [redacted]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Conventional Weapons Demilitarization: A Health and Environmental Effects Data Base Assessment

12. SUBJECT AREAS
06 06 Environmental Biology; 06 09 Hygiene and Sanitation; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 10	86 11	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 10	EXPIRATION 85 10	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	83PP3818			
c. TYPE	d. AMOUNT 439700	84	0.2	32
e. KIND OF AWARD SUP	f. CUM/TOTAL 736480	85	4.0	440

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Environmental Sciences Division Lawrence Livermore National Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS P.O. Box 5507 Livermore, CA 94550
c. NAME OF RESPONSIBLE INDIVIDUAL ROSENBLATT, D H	c. NAME OF PRINCIPAL INVESTIGATOR LAYTON, D
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 415-422-0918
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY/CIVILIAN APPLICATION: H	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)* MEADE, W

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Chemical Hazards; (U) Health Protection; (U) Demilitarization; (U) Environmental Effects; (U) RAD III; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To assemble and evaluate a data base defining state-of-the-art knowledge of the US Army's current and proposed conventional weapons demilitarization processes and their effluents, and of environmental effects associated with the effluents.

24. (U) The first phase will consist of preliminary compilation and evaluation of information: formulation of a search strategy; acquisition of documents and other types of information; location of sites and sources of demilitarization products; determination of current demilitarization processes, their effluents; development of the pathways of these effluents into the environment; and criteria for selecting the processes and products of greatest interest. The second phase will be concerned with thorough data searches and evaluations for selected chemicals.

25. (U) 8401 - 8410. Collected data base, including a list of demilitarization activities and amounts of materials requiring disposal.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE U.S. G.P.O. 1984-421-646/17001

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA303024	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 09 13	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	007
b. CONTRIBUTING				
c. [illegible]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Acute Toxicity of Smoke Screen Materials to Aquatic Organisms

12. SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 10	85 01	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 10	EXPIRATION 85 01	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	84PP4800			
c. TYPE	d. AMOUNT -0-	84	1.2	85
e. KIND OF AWARD	f. CUM/TOTAL 226152	85	1.3	124

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Energy Programs Division US Department of Energy
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS P.O. Box 550 Richland, WA 99352
c. NAME OF RESPONSIBLE INDIVIDUAL van der SCHALIE, W H	c. NAME OF PRINCIPAL INVESTIGATOR POSTON, T M
d. TELEPHONE NUMBER *(include area code)* 301-663-7627	d. TELEPHONE NUMBER *(include area code)* 509-376-5678
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Lab Animals; (U) Fish; (U) Aquatic Toxicology; (U) Fog Oil; (U) White Phosphorus; (U) Red Phosphorus; (U) Smoke; (U) Toxicity; (U) RAD III; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The Army utilizes various smokes at training facilities around the country, and there is a need to define the possible environmental hazards associated with these materials. This research will determine the acute toxicity to aquatic organisms of several Army smoke materials (fog oil and fog oil smoke, white phosphorus-felt smoke, and red phosphorus butyl rubber smoke).

24. (U) Appropriate dosing procedures and analytical methods for the smoke materials will first be developed and validated. The acute toxicity of each material to freshwater fish, invertebrates, and algae will then be determined.

25. (U) 8309 - 8409. Dosing procedures and analytical methods have been developed for all test materials. Range-finding studies have shown that the toxicity to aquatic organisms of white phosphorus-felt and red phosphorus-butyl rubber smokes are primarily due to the acidity of aqueous solutions of these materials. The toxicity of fog oil and fog oil smoke to the aquatic invertebrate Daphnia magna was relatively low.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 303077	2. DATE OF SUMMARY 84 09 10	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 04 19	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	008
b. CONTRIBUTING				
c. ~~CONTRIBUTING~~	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*

(U) Terrestrial Microcosm Evaluation of Two Army Smoke-Producing Compounds

12. SUBJECT AREAS

06 06 Environmental Biology; 07 02 Inorganic Chemistry; 07 04 Physical Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 12	85 03	DA	B Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 10	EXPIRATION 85 03	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-84-C-4001	84	2.0	198
c. TYPE U CPFF	d. AMOUNT 87323	85	1.0	87
e. KIND OF AWARD SUP	f. CUM/TOTAL 365497			

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Battelle Memorial Institute Columbus Laboratories
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS 505 King Avenue Columbus, OH 43201-2693
c. NAME OF RESPONSIBLE INDIVIDUAL BRATT, G M	c. NAME OF PRINCIPAL INVESTIGATOR DUKE, K M
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 614-424-6426
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION U	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Terrestrial Microcosm; (U) White Phosphorus/Felt; (U) Red Phosphorus/Butyl Rubber; (U) RAD III

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objective of this study is to evaluate the applicability of the terrestrial microcosm as a hazard assessment tool for chemicals used by the Army, by evaluating the effects of two Army smokes, white phosphorus/felt (WP/F) and red phosphorus/butyl rubber (RP/BR), on ecosystem-level processes.

24. (U) The intact-soil-core microcosm techniques will be used to evaluate ecosystem-level processes. Terrestrial microcosms will be constructed and planted, smokes characterized, and microcosm's dosed. A range-find and then definitive tests will precede chemical analyses. Nutrient loss, plant productivitiy, trace element uptake, and soil respiration will be monitored. Soil leachate studies will be done concurrently.

25. (U) 8401 - 8409. The study has progressed satisfactorily. The red phosphorus/butyl rubber derived smoke seems to have little adverse impact on plants at field relevant concentrations. Final report on this smoke is in preparation.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA303762	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 01 04	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	010
b. CONTRIBUTING				
c. [redacted]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*

(U) Army Environmental Quality Technology Program Coordination

12. SUBJECT AREAS

05 01 Administration and Management; 05 02 Documentation and Information Technology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 02	84 10	DA	D Other Gov't

17. CONTRACT GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 02	EXPIRATION 84 10	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT GRANT NUMBER	84II4007			
c. TYPE	d. AMOUNT -0-	84	0.4	30
e. KIND OF AWARD CON	f. CUM/TOTAL 30000	85	0.4	30

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Construction Engineering Research Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS P.O. Box 4005 Champaign, IL 61820
c. NAME OF RESPONSIBLE INDIVIDUAL BARKLEY, J J	c. NAME OF PRINCIPAL INVESTIGATOR NOVAK, E W
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 217-352-6511
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*

(U) Program Coordination; (U) EQTCC; (U) Army Environmental Program; (U) RAD III

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objectives are: (a) review and coordinate the Environmental Quality Technology (EQT) program; (b) schedule and plan such reviews; (c) review and evaluate Air Force, Navy and other Federal agency programs; (d) revise, update and coordinate the FY83 EQT Briefing; (e) keep current with environmental trends and (f) develop and distribute an EQT Information Bulletin.

24. (U) The approach will consist of essentially correspondence and coordination meetings covering the objective topics.

25. (U) 8401 - 8409. The objectives are being met.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA303914	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 04 19	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	011
b. CONTRIBUTING				
c. [redacted]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) A Health and Environmental Effects Data Base Assessment of US Army Waste Material

12. SUBJECT AREAS 06 06 Environmental Biology; 05 02 Documentation and Information Technology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 04	85 06	DA	B Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 04	EXPIRATION 85 06	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-84-C-4133			
c. TYPE	d. AMOUNT -0-	84	0.8	26
e. KIND OF AWARD CON	f. CUM/TOTAL 90736	85	3.5	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Carltech Associates, Inc.
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS P.O. Box 1158 Columbia, MD 21044
c. NAME OF RESPONSIBLE INDIVIDUAL SMALL, M J	c. NAME OF PRINCIPAL INVESTIGATOR UHRMACHER, J C
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 301-596-5912
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*

(U) Data Base Assessment; (U) Hazardous Wastes; (U) Environmental Effects; (U) RAM III

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objective of this study is to assemble and evaluate a data base defining state-of-the-art knowledge of the health and environmental effects associated with selected Army-unique toxic and hazardous waste materials.

24. (U) This study shall be conducted in two phases. Phase I shall be a comprehensive data base compilation during which Army contacts are made, the magnitude of the problem assessed, and waste materials selected for study. Phase II shall be data acquisition and evaluation.

25. (U) 8401 - 8409. Phase I is in progress.

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EDITION OF MAR 68 IS OBSOLETE

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA304000	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 02 24	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	012
b. CONTRIBUTING				
c. [illegible]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Field Measurement and Model Evaluation Program for Assessment of the Environmental Effects of Military Smokes

12. SUBJECT AREAS

04 01 Atmospheric Physics; 07 03 Organic Chemistry; 06 21 Weapon Effects

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 04	87 04	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 04	EXPIRATION 87 04	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	84PP4822			
c. TYPE	d. AMOUNT -0-	84	3.1	183
e. KIND OF AWARD CON	f. CUM/TOTAL 183100	85	3.3	197

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Argonne National Laboratory Experimental Research Division
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Argonne, IL 60439
c. NAME OF RESPONSIBLE INDIVIDUAL PARMER, D L	c. NAME OF PRINCIPAL INVESTIGATOR POLICASTRO, A J
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 312-972-3235
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* DUNN, W
MILITARY/CIVILIAN APPLICATION: L	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*

(U) Smoke Deposition; (U) Mathematical Modeling; (U) Fog Oil; (U) RAD III; (U) PO

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The principal objective of this work is to develop mathematical model and chemical sampling techniques applicable to predictions of the environmental impact of deposited smoke material on the soil, water, plant and animal life indigenous to representative areas where smokes are employed.

24. (U) Mathematical modeling and chemical sampling techniques will be evaluated in a series of progressively complex terrain and meteorological situations. The first field trial series will utilize the existing smoke modeling facilities of the US Army Dugway Proving Ground to understand the downwind dispersion of fog oil generated by a standard US Army tactical smoke generation.

25. (U) 8404 - 8409. The contractors have assembled all equipment for the experimentation. Laboratory tests have been conducted on certain of the sampling devices. A draft report has been prepared on models and data available in the literature and provided to USAMBRDL. A scope of work has been established for Dugway Proving Ground to support the field trials. A meeting will be conducted in the near future at DPG to discuss the experimental plan.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA304087	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 02 13	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	013
b. CONTRIBUTING				
c. XXXXXXXXXX	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Evaluate and Characterize Mechanisms Controlling Transport, Fate and Effects of Army Smokes in the Aerosol Wind Tunnel

12. SUBJECT AREAS

07 02 Inorganic Chemistry; 07 03 Organic Chemistry; 06 06 Environmental Biology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 04	85 11	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 04	EXPIRATION 84 10	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	84PP4819			
c. TYPE	d. AMOUNT -0-	84	2.9	288
e. KIND OF AWARD CON	f. CUM/TOTAL 288452	85	3.1	384

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Battelle Northwest Laboratories
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS P.O. Box 999 Richland, WA 99352
c. NAME OF RESPONSIBLE INDIVIDUAL BARKLEY, J J	c. NAME OF PRINCIPAL INVESTIGATOR VAN VORIS, P
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 505-375-2498
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY/CIVILIAN APPLICATION: L	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Smokes; (U) Wind Tunnel; (U) Fog Oil; (U) White Phosphorus/Felt; (U) Red Phosphorus/Butyl Rubber; (U) Ecological Effects; (U) Fate; (U) RAD II

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)* (U) PO

23. (U) The objective of this research is to define the fate and ecological effects of military smoke derived from Fog Oil, White Phosphorus/Felt (WP/F) and Red Phosphorus/Butyl Rubber (RP/BR).

24. (U) The research approach will entail the generation of the three smokes individually in a wind tunnel under various meteorological conditions. The physical and chemical properties of the smokes will be assessed. The effect on plants and deposition rates will be determined.

25. (U) 8402 - 8409. Studies on RP/BR are underway. Some adverse plant surface effects have been noted. The cause of these effects at present is unknown.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA304532	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 04 25	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	014
b. CONTRIBUTING				
c. XXXXXXXXXG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Water Quality Criteria for Six Munitions Compounds

12. SUBJECT AREAS
19 01 Ammunition, Explosives and Pyrotechnics; 06 02 Bioengineering; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 06	87 03	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 06	EXPIRATION 84 10		
b. CONTRACT/GRANT NUMBER	84PP4845		
c. TYPE	d. AMOUNT -0-		
e. KIND OF AWARD SUP	f. CUM/TOTAL 150000		

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	2.5	150
85	3.3	200

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Chemical Effects Information Center Oak Ridge National Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS P.O. Box X Oak Ridge, TN 37830
c. NAME OF RESPONSIBLE INDIVIDUAL PARMER, D L	c. NAME OF PRINCIPAL INVESTIGATOR ROSS, R H
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 615-574-7797
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* ENSMINGER, J T g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Water Quality Criteria; (U) RDX; (U) Nitrocellulose; (U) Nitroglycerin; (U) White Phosphorous; (U) 2,4-Dinitrotluene; (U) 2,4,6-TNT; (U) RAD III;

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)* (U) PO

23. (U) The proposed research will summarize and evaluate the existing health and environmental effects and fate data on RDX, nitrocellulose, nitroglycerine, white phosphorus, 2,4-dinitrotoluene, and 2,4,6-trinitrotoluene. The summarized and evaluated data will be applied to water quality criteria methodologies developed by the US Environmental Protection Agency. Additionally, when necessary data are not available, research needs will be identified.

24. (U) The proposed work will involve collection of reports, journal publications and proceedings of symposia with special attention to the work conducted in support of Army-related activities. For some of the compounds of interest, research is ongoing and contact with the appropriate researchers will be established to obtain the latest information. The information will be evaluated, summarized and when possible applied to water quality criteria methodologies.

25. (U) 8406 - 8410. Literature searches are ongoing and hardcopy references are being obtained. EPA changes in water quality criteria methodologies are being evaluated. Some literature summation and data evaluation, principally for RDX has begun.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA305052	2. DATE OF SUMMARY 84 07 30	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY A NEW	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	015
b. CONTRIBUTING				
c. ~~CONTRIBUTING~~	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Environmental Fate of Nitroguanidine, Diethyleneglycol Dinitrate, and Hexachloroethane Smoke

12. SUBJECT AREAS

07 02 Inorganic Chemistry; 07 03 Organic Chemistry; 06 13 Microbiology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 09	86 02	DA	B Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 09	EXPIRATION 85 10	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-84-C-4252			
c. TYPE U	d. AMOUNT 297000	84	4.2	297
e. KIND OF AWARD NEW	f. CUM/TOTAL 583521	85	3.5	350

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME SRI International
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS 333 Ravenswood Avenue Menlo Park, CA 94025
c. NAME OF RESPONSIBLE INDIVIDUAL KELLY, J A	c. NAME OF PRINCIPAL INVESTIGATOR SPANGGORD, R J
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 415-326-6200
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY CIVILIAN APPLICATION U	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Environmental Fate; (U) Chemical Transformation; (U) Biodegradation; (U) Zinc Chloride; (U) RAD III

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To conduct laboratory experiments that will lead to the discovery and definition of the dominant environmental processes (chemical, physical, and biological) acting on the Army propellant components, nitroguanidine and diethyleneglycol dinitrate, upon their release into the aqueous environment. Also to be studied is hexachloroethane smoke and the combustion products, associated with its deployment, upon their discharge into the air, soil, and water environments.

24. (U) A literature survey and laboratory screening studies shall comprise Phase I. If the literature data base in Phase I is found to be inadequate or any process screened is found to be significant in defining the degradation or transformation of these compounds, then appropriate rate studies shall be undertaken for this dominant process or processes in Phase II. Any rate data discovered in the literature survey or determined in Phase II shall input into a computer model of aqueous environmental fate of munition compounds or a computer simulation of environmental fate of smoke compounds. Definitive laboratory Phase II studies shall be accomplished only if data from Phase I warrant such studies. Performance of Phase II is at the option of the Government.

25. (U) None.

DD FORM 1498 EDITION OF MAR 68 IS OBSOLETE

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA300877	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 01 27	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	039
b. CONTRIBUTING				
c. XXXXXXXXXXXXG	STOC 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Data Base Assessment of Health and Environmental Effects of Munition Production Waste Products

12. SUBJECT AREAS

19 01 Ammun Exp Pyrot; 05 02 Documentation and Information Technology; 07 03 Org Chem

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 10	85 08	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 03	EXPIRATION 85 08	FISCAL YEARS	a. PROFESSIONAL WORK YEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	83PP3802			
c. TYPE	d. AMOUNT -0-	84	1.7	121
e. KIND OF AWARD	f. CUM/TOTAL 242000	85	0.6	44

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Oak Ridge National Labo atory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Post Office Box X Oak Ridge, TN 37830
c. NAME OF RESPONSIBLE INDIVIDUAL ROSENCRANCE, A B	c. NAME OF PRINCIPAL INVESTIGATOR ENSMINGER, J T
d. TELEPHONE NUMBER *(include area code)* 301-663-2340	d. TELEPHONE NUMBER *(include area code)* 615-574-7794
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY CIVILIAN APPLICATION M	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Solid Wastes; (U) Pollution Control; (U) Data Assessment; (U) Munitions; (U) RAD III; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objectives of this research are: (a) to establish and assess the literature data base on the improvements in the technology of munition plant waste treatment over the last decade, and (b) to collect the existing and/or proposed federal, state, and local regulations as they apply to munition plant wastes.

24. (U) The approach will involve collection of recent reports in the open literature, particularly status reports from Army ammunition plants. On-site visits will be made; latest technological developments will be discussed; and regulatory aspects will be thoroughly investigated.

25. (U) 8401 - 8409. Final report from initial study on munition wastes completed. Extractability of waste munition phase completed and draft report received. Final task of collecting the existing and/or proposed federal, state, and locak regulations as they apply to munition plant wastes is nearing completion and a draft report expected in second quarter FY85.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 2232	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 12 27	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	055
b. CONTRIBUTING	61102A	3E161102BS04	AA	
c. CONTRIBUTING	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Determination of the Toxicity to Aquatic Organisms of HMX and Related Wastewater Constituents

12 SUBJECT AREAS
06 06 Environmental Biology; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
80 02	84 12	DA	B Contract

17. CONTRACT/GRANT
a. DATE EFFECTIVE 84 04 EXPIRATION 84 12
b. CONTRACT/GRANT NUMBER DAMD17-80-C-0011
c. TYPE U d. AMOUNT -0-
e. KIND OF AWARD CON f. CUM/TOTAL 529794

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.6	50
85	0.8	00

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME EG&G International, Inc. Bionomics Division
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS 790 Main Street Wareham, MA 02571
c. NAME OF RESPONSIBLE INDIVIDUAL van der SCHALIE, W H	c. NAME OF PRINCIPAL INVESTIGATOR PETROCELLI, S R
d. TELEPHONE NUMBER *(include area code)* 301-663-7627	d. TELEPHONE NUMBER *(include area code)* 617-295-2550

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY-CIVILIAN APPLICATION: H

e. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) HMX; (U) SEX; (U) TAX; (U) Munitions; (U) Lab Animals; (U) Fish; (U) Aquatic Toxicology; (U) Wastewater; (U) RAD III

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Determine the effects of Army Ammunition Plant water pollutants (HMX, SEX, and TAX) on aquatic organisms. Provide aquatic toxicological data for the development of effluent standards for these compounds from Army Ammunition Plants.

24. (U) Conduct laboratory toxicity tests on a wide variety of aquatic organisms, including fish, microinvertebrates, and algae. Static and flow-through acute tests with both fish and invertebrates will be performed; further chronic tests with an invertebrate and early life stage tests with fish will also be done. Bioconcentration potential and the effects of water quality parameters on toxicity will be investigated. Data will be used to calculate water quality criteria according to the 1977 Clean Water Act (and subsequent modifications).

25. 8309 - 8409. Interlatoratory testing of a chronic Daphnia magna toxicity testing protocol has been initiated. A total of 12 laboratories are participating, and tests with three of the six toxicant materials selected for use in the study have been completed. Funds received to date (Block 17f) do not include $144,900 provided by the US Environmental Protection Agency under an interagency agreement.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 300881	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 01 20	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO. CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	61102A	3E162777A878	CA	290
b. CONTRIBUTING				
c. [illegible]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Data Base Assessment of Environmental and Toxicological Factors in Water to Update and Modernize Content of TB Med 577

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 10	85 06	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 01	EXPIRATION 84 12	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	82PP2817			
c. TYPE	d. AMOUNT -0-	84	10.5	700
e. KIND OF AWARD CON	f. CUM/TOTAL 1540000	85	2.1	140

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Lawrence Livermore National Laboratory Environmental Sciences Division
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS University of California P.O. Box 5507, Livermore, CA 94550
c. NAME OF RESPONSIBLE INDIVIDUAL SCHAUB, S A	c. NAME OF PRINCIPAL INVESTIGATOR ANSPAUGH, L R
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 415-422-8361
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* DANIELS, J I
MILITARY/CIVILIAN APPLICATION L	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)* LAYTON, D W

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Potable Water; (U) Toxicology; (U) Risk Assessment; (U) Field Analysis; (U) Pollution; (U) Treatment; (U) RAD LLL; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The proposed Data Base Assessment Study is a multifaceted evaluation of the current technical data base for waterborne constituents of health concern related to the preventive medicine mission in field water supply. Emphasis is placed on: identification of significant chemical, biological and radiological pollutants and warfare agents in water; establishment of health criteria and standards for various use conditions and exposure risk assessments; and scenario specific contaminant problems.

24. (U) Study will utilize broad based literature search and personal contact with various Army communities to derive input to assessment study. The major waterborne constituents of concern will be identified based upon their occurrence, treatability, impact on field troop health and risk to accomplishment of Army missions. Appropriate methodologies for preparing health criteria will be selected and used to develop such criteria and subsequent standards based upon exposure duration, concentrations, and acceptable troop performance to maintain combat effectiveness. Risk analysis will be performed to develop command decision tables, nomograms, matrices for use where combat decisions may hinge on use and subsequent effects of subpotable water.

25. (U) 8401 - 8409. Screening studies to identify important organic, inorganic, and sabotage poisons, and also pathogens in field water supplies have been completed. New water quality standards have been recommended for the following constituents: chloride, sulfate, nitrate, magnesium, arsenic, cyanide, total dissolved solids, turbidity, color and radionucleotides.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 305429	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 05 31	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62777A	3E162777A878	CA	289
b. CONTRIBUTING				
c. [redacted]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Evaluation of DEGDN (Diethyleneglycoldinitrate) and Two DEGDN Containing Compounds

12. SUBJECT AREAS
06 20 Toxicology; 06 10 Industrial (occupational) Medicine

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 06	85 04	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 06 EXPIRATION 85 04

b. CONTRACT/GRANT NUMBER 84PP4856

c. TYPE d. AMOUNT -0-

e. KIND OF AWARD CON f. CUM/TOTAL 80128

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	1.3	80
85	0.0	00

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL
PARMER, D L

d. TELEPHONE NUMBER *(include area code)*
301-663-7207

20. PERFORMING ORGANIZATION

a. NAME Laboratory for Energy-Related Health Research

b. ADDRESS School of Veterinary Medicine
University of California
Davis, CA 95616

c. NAME OF PRINCIPAL INVESTIGATOR
GOLDMAN, M

d. TELEPHONE NUMBER *(include area code)*
916-752-1340

21. GENERAL USE
Foreign Intelligence Not Applicable

MILITARY/CIVILIAN APPLICATION
H

e. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Chemical Hazards; (U) Mutagenicity; (U) Carcinogenicity; (U) Diethyleneglycoldinitrate; (U) Nitrate ester propellants; (U) RAD III; (U) PO

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To determine possible mutagenicity and carcinogeniity of Diethyleneglycoldinitrate (DEGDN) and two propellant formulations containing DEGDN.

24. (U) DEGDN and two propellant formulations - JA2 and DIGL-RP will each be subjected to two assays. The mouse lymphoma mutation assay will show that the suspect compounds are also capable of mutating mammalian cells. A final cell transformation will provide an in vitro test capable of identifying a candidate compounds carcinogenicity.

25. (U) 8406 - 8409. Project delayed while awaiting sample shipment from Radford Army Ammunition Plant.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG 7494	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 12 12	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62777A	3E162777A878	CA	287
b. CONTRIBUTING				
c. [illegible]NG	STOG 82/83-6.2	2		

11. TITLE *(Precede with Security Classification Code)*
(U) Neurobehavioral Effects of Carbon Monoxide (CO) Exposure in Humans

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 21 Weapons Effects

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 08	86 08	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 08	EXPIRATION 85 08	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	81PP1812			
c. TYPE	d. AMOUNT -0-	84	3.2	250
e. KIND OF AWARD CON	f. CUM/TOTAL 490000	85	2.5	184

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Environmental Protection Agency Health Effects Research Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Neurotoxicology Division Research Triangle Park, NC 27711
c. NAME OF RESPONSIBLE INDIVIDUAL KELLY, J A	c. NAME OF PRINCIPAL INVESTIGATOR BENIGNUS, V A
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 919-541-2601
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Chemical Study; (U) Carbon Monoxide; (U) Weapons Health and Performance Effects; (U) Neurobehavioral Effects; (U) Human Volunteers; (U) RAD I I

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)* (U) PO

23. (U) The overall objective of this study program is to evaluate the neurobehavioral and performance effects of CO in humans in order to identify and assess, quantitatively, militarily crew performance effects upon exposure during operation of ground and aircraft weapons.

24. (U) Through a sequence of human clinical study protocols culminating in a field research study, the neurobehavioral effects of CO exposure in young healthy volunteer test subjects will be evaluated. Performance parameters under protocol evaluation will include perceptual, vigilance, psychomotor, intellectual and selected physiological variables in exposed and control subgroups of volunteers exposed to CO. Performance tasks and CO exposure conditions will be designed to simulate Army weapons system crew space conditions and volunteers will be young healthy males to represent the military field soldier weapon system operator work force.

25. (U) 8312 - 8409. Progress for this period included: (1) high level transient (CO) protocol has been approved by the University of North Carolina and The Surgeon General's Human Use Committees and the protocol will begin in the near future; (2) Putz replication study completed, (3) pilot study for Speech Perception in Noise (SPIN) hearing completed, and (4) planning for field studies in the near future has been initiated.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG 7496	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 12 15	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62777A	3E162777A878	CA	286
b. CONTRIBUTING				
c. XXXXXXXXXX	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Human Health Studies of Carbon Monoxide (CO) Under Conditions of Military Weapons System Crewman Exposures

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 21 Weapons Effects

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 08	86 08	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE	84 10	EXPIRATION	85 10
b. CONTRACT/GRANT NUMBER	81PP1811		
c. TYPE		d. AMOUNT	-0-
e. KIND OF AWARD	CON	f. CUM/TOTAL	859000

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	1.3	100
85	2.2	200

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Environmental Protection Agency Health Effects Research Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Clinical Studies Branch Research Triangle Park, NC 27711
c. NAME OF RESPONSIBLE INDIVIDUAL REDDY, G	c. NAME OF PRINCIPAL INVESTIGATOR PETROVICK, M L
d. TELEPHONE NUMBER *(include area code)* 301-663-7104	d. TELEPHONE NUMBER *(include area code)* 919-541-3804
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY-CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Clinical Study; (U) Carbon Monoxide; (U) Carboxyhemoglobin; (U) Weapons Health Effects; (U) Human Volunteers; (U) RAD III; (U) PO

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The overall objective of this study program is to develop an improved biomedical data base on the physiologic effects of CO exposure and the relationship of CO exposure to carboxyhemoglobin (COHb) formation in man, focusing on militarily relevant personnel workload parameters and CO concentration exposure profiles associated with field weapons.

24. (U) Through a sequence of human clinical study protocols culminating in a field research study, the cardiopulmonary physiologic effects of CO exposure will be evaluated. The series of building block protocols will be designed to achieve a biomedical data base relevant to military workload parameters and CO exposure profiles associated with ground and aircraft weapons systems. Concurrent study emphasis is on refining/validating the modeling algorithm aproach for predicting COHb levels in man, and human study protocols will be designed and conducted to focus on the key parameters of existing algorithms, with empirical data endpoints designed to achieve an improved algorithm for military design and operational compliance testing with the current COHb standards.

25. (U) 8312 - 8409. Steady state low concentration of CO (100 ppm) exposure at military relevant workload was completed. Parameters such as COHb pulmonary functions were measured; selected 13 subjects data for CFK equation analysis and identified important variables for comprehensive evaluation of COHb modeling algorithms. Preparation of draft report on completed work is in progress.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG 7492	2. DATE OF SUMMARY 84 09 12	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 12 05	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62777A	3E762777A878	CA	285
b. CONTRIBUTING				
c. XXXXXXXXXX	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Inhalation Toxicology of Fog Oil Obscurant

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 08	85 08	DA	D Other Government

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 12	EXPIRATION 85 08
b. CONTRACT/GRANT NUMBER	81PP1810
c. TYPE	d. AMOUNT
e. KIND OF AWARD CON	f. CUM/TOTAL 1512493

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	4.9	282
85	2.5	0

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL
FINCH, R A

d. TELEPHONE NUMBER *(include area code)*
301-663-7104

20. PERFORMING ORGANIZATION

a. NAME Inhalation Toxicology Branch, MD-82 Health Effects Research Laboratory

b. ADDRESS
USEPA
Research Triangle Park, NC 27711

c. NAME OF PRINCIPAL INVESTIGATOR
SELGRADE, M

d. TELEPHONE NUMBER *(include area code)*
919-541-2531

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY CIVILIAN APPLICATION

f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
GRAHAM, J

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
DAVIES, D

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Fog Oil; (U) Smoke; (U) Obscurant; (U) Mammalian Toxicology; (U) Lab Animals; (U) Rats; (U) RAD III; (U) PO

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Comprehensive definition of the toxicologic effects of the Army fog oil smoke system.

24. (U) Sprague-Dawley rats will be exposed to aerosols of fog oil smoke in whole body, dynamic flow exposure chambers. The four phases of the study include determination of the LC50 at two time periods, range-finding studies for repeated exposures, biologic effects of various intermittent repeated exposure regimens, and 13 week exposures with 4 to 8 week recovery.

25. (U) 8[illegible] - 8409 - The range-finding studies showed that the petroleum aerosol produced a marked reduction in body weight which was due to anorexia. Since the reduced food consumption may have been due to preening, nose only exposures were also conducted. Since reduced body weight was also observed with this method of exposure, the toxicity was probably due to lung deposition of the aerosol. A 90-day subchronic inhalation study with male rats has been completed and data reduction is in progress.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG 5136	2. DATE OF SUMMARY 84 09 17	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 06 29	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N BF	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62777A	3E162777A878	CA	284
b. CONTRIBUTING				
c. [illegible]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Chemical Characterization and Toxicologic Evaluation of Airborne Mixtures

12. SUBJECT AREAS
06 10 Industrial (occupational) medicine; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
79 07	85 06	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 09	EXPIRATION 85 06	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	82PP2802	84	2.2	118
c. TYPE	d. AMOUNT 18000	85	0.7	68
e. KIND OF AWARD CON	f. CUM/TOTAL 382000			

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Department of Energy (DOE) Oak Ridge National Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS P.O. Box X Oak Ridge, TN 37831
c. NAME OF RESPONSIBLE INDIVIDUAL EATON, J C	c. NAME OF PRINCIPAL INVESTIGATOR GUERIN, M R
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 615-574-4860
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Diesel Fuel; (U) Smoke/Obscurants; (U) Red Phosphorus; (U) Mammalian Toxicology; (U) Chemistry; (U) Aerosol; (U) RAD III; (U) Lab Animals; (U) Rats; (U) PO

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Various developmental and fielded smoke systems are to be chemically and physically characterized as part of an evaluation of the potential health effects on exposed troops during testing and training and on the battlefield. Other industrial materials are to be characterized for evaluation as industrial workplace hazards. Toxicologic evaluation of smoke/obscurant aerosols will include short-term tests and mammalian inhalation exposures.

24. (U) The process of evaluation of aerosolized materials begins with the development of laboratory-scale generators that model the fielded smoke system. Various instrumental techniques are used to chemically characterize the starting materials and the deployed smoke. Inhalation toxicity testing is conducted in three phases: acute single exposures for range finding; multiple exposures to define the major physiological effects; and subchronic exposures to define the no observed adverse effects level and to study recovery after a series of exposures.

25. (U) 84 06 - 84 09. Two final reports on different tasks have been published: Inhalation Toxicology of Diesel Fuel Obscurant Aerosol in Sprague-Dawley Rats, Phase 2, Repeated Exposures, ADA142540; and Chemical and Physical Characterization of Diesel Fuel Smoke, ADA142718.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOH0386	2. DATE OF SUMMARY 84 08 27	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 05 23	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62777A	3E162777A878	CA	282
b. CONTRIBUTING				
c. XXXXXXXXXXXX	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Research and Development on Inhalation Toxicologic Evaluation of Red Phosphorus/Butyl Rubber Combustion Products

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 05	85 03	DA	B Contract

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 10	EXPIRATION 85 03
b. CONTRACT/GRANT NUMBER	DAMD17-82-C-2121
c. TYPE U	d. AMOUNT 217147
e. KIND OF AWARD SUP	f. CUM/TOT 16272246

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	4.2	360
85	2.5	217

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME IIT Research Institute
b. ADDRESS *(include zip code)* Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS 10 West 35th Street, Chicago, IL 60616
c. NAME OF RESPONSIBLE INDIVIDUAL FINCH, R A	c. NAME OF PRINCIPAL INVESTIGATOR ARANYI, C
d. TELEPHONE NUMBER *(include area code)* 301-663-7104	d. TELEPHONE NUMBER *(include area code)* 312-567-4864
21. GENERAL USE Foreign Intelligence MILITARY/CIVILIAN APPLICATION H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* FENTERS, J g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Red Phosphorus/Butyl Rubber; (U) Smoke; (U) Obscurants; (U) Mammalian Toxicology; (U) RAD III; (U) Lab Animals; (U) Rats

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Comprehensive definition of the toxicologic effects of inhalation of red phosphorus/butyl rubber screening smoke.

24. (U) Sprague-Dawley rats will be exposed to aerosols of red phosphorus/butyl rubber smoke in whole body, dynamic flow exposure chambers. The four phases of the study include determination of LC50 at two time periods, range-finding study for repeated exposures, biologic effects of various intermittent repeated exposure regimens, ,and 13 week exposures with 4 to 8 week recovery using one or two repeated exposure regimens.

25. (U) 8401-8408. The range-finding study for repeated exposures showed statistically significant decreases in pulmonary bactericidal activity and pulmonary free cells after exposure to the aerosol. Results also suggest that exposure concentration is the determining factor in toxicity; duration of exposure has a minor role. The intermittent repeated exposure regimen studies have been completed. The 90-day subchronic study is in progress.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
				DAOG9379	84 10 22	DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
84 08 29	D. CHANGE	U	U		CX	

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62772A	3S162772A874	BA	260
b. CONTRIBUTING				
c. CONTRIBUTING	STOG 82783-6,274			

11. TITLE *(Precede with Security Classification Code)*
(U) Flywheel-Powered Mobile X-Ray Generator with Fluoroscopic Capability

12. SUBJECT AREAS
06 12 Medical and hospital equipment; 06 02 Bioengineering

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 01	85 02	DA	B. Contract

17. CONTRACT/GRANT			
a. DATE EFFECTIVE	84 10	EXPIRATION	85 02
b. CONTRACT/GRANT NUMBER	DAMD17-82-C-2050		
c. TYPE	S	d. AMOUNT	$ 29,784
e. KIND OF AWARD	EXT	f. CUM/TOTAL	$292,425

18. RESOURCES ESTIMATE		
FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.0	0
85	0.5	30

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME: US Army Medical Bioengineering Research & Development Laboratory	a. NAME: Instrumentation Systems Center University of Wisconsin
b. ADDRESS *(include zip code)*: Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS: 750 University Avenue, Madison, WI 53706
c. NAME OF RESPONSIBLE INDIVIDUAL: Salisbury, L L	c. NAME OF PRINCIPAL INVESTIGATOR: Siedband, M P
d. TELEPHONE NUMBER *(include area code)*: 301-663-7527	d. TELEPHONE NUMBER *(include area code)*: 608-263-1552
21. GENERAL USE: Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) X-ray; (U) Flywheel-Powered; (U) Energy Storage; (U) Bioengineering; (U) RAM II

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To develop a flywheel-powered mobile X-ray system for clinical and field evaluation.

24. (U) Using the low duty cycle requirements of an X-ray system, it is intended to store energy in a motor-generator-flywheel combination to reduce the peak energy demands from the main power source.

25. (U) (8406-8410) Problems were encountered with the high voltage control switching circuit, and a redesign using an alternate approach was required.

DD FORM 1498 83 MAR — EDITION OF MAR 68 IS OBSOLETE. — U.S. G.P.O. 1984-421-645/17001

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA304534	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	64757A	3M464757D848	CB	002
b. CONTRIBUTING				
c. CXXXXXXXXX	CARDS 1243			

11. TITLE *(Precede with Security Classification Code)*
(U) Chemical Agent Testing of the Chemical Warfare Agent Protective Patient Wrap

12. SUBJECT AREAS 15 02 Chemical, biological, and radiological warfare; 06 12 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 06	84 12	DA	D. Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 06	EXPIRATION 84 12		
b. CONTRACT/GRANT NUMBER	84PP4849		
c. TYPE	d. AMOUNT 0		
e. KIND OF AWARD CON	f. CUM/TOTAL $720,110		

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	41	720
85	0	0

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL
Reams, W H

d. TELEPHONE NUMBER *(include area code)*
301-663-7527

20. PERFORMING ORGANIZATION

a. NAME US Army Dugway Proving Ground
ATTN: STEDP-PO

b. ADDRESS
Dugway, UT 84022

c. NAME OF PRINCIPAL INVESTIGATOR
Murray, V

d. TELEPHONE NUMBER *(include area code)*
801-522-3531

21 GENERAL USE
Foreign Intelligence Considered
MILITARY/CIVILIAN APPLICATION: M

f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Chemical Agent Protection; (U) RAM V; (U) PO; (U) Chemical Defense; (U) Patient Treatment;

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To test protective patient wraps to determine their effectiveness in protecting patients from chemical warfare agents present on the chemical warfare battlefield.

24. (U) Protective patient wraps developed by the US Army Natick Research and Development Center under Intra-Army Order 1012 will be sent to Dugway Proving Ground, UT, to determine their effectiveness in protecting patients from chemical warfare agents.

25. (U) (8406-8409) Liquid agent testing of swatches of six candidate fabrics is under way. Tests of full-scale wraps using instrumented mannequins are planned for mid FY 85. Insufficient data are available to indicate which of the six candidate fabrics will be chosen for the final design.

DD FORM 1498 83 MAR EDITION OF MAR 68 IS OBSOLETE.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA306599	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 01 10	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9 LEVEL OF SUM A WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	019
b. CONTRIBUTING				
c. [redacted]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Environmental Effect Studies on EA5763

12. SUBJECT AREAS
06 06 Environmental Biology; 07 02 Inorganic Chemistry; 07 04 Physical Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 02	85 08	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 02	EXPIRATION 85 08	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	84PP4804			
c. TYPE	d. AMOUNT -0-	84	2.3	229
e. KIND OF AWARD CON	f. CUM/TOTAL 229441	85	2.0	00

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Army Armament Munitions & Chemical Command
b. ADDRESS *(include zip code)* Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS Chemical Research & Development Ctr. Aberdeen Proving Ground, MD 21010
c. NAME OF RESPONSIBLE INDIVIDUAL GARDNER, H S	c. NAME OF PRINCIPAL INVESTIGATOR WENTSEL, R S
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)*
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Environmental Fate; (U) Ecological Effects; (U) Screening Smoke; (U) Terrestrial Effects; (U) Fish; (U) Rats; (U) RAD III; (U) PO

23. TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The objective of this study is to develop baseline environmental data on the screening smoke composition, EA5763.

24. (U) The research will address the fate of EA5763 in soil and water, the toxicity to terrestrial plants and soil organisms, and the ventilatory response of fish exposed to the smoke. EA5763 will be characterized. Nutrient loss, plant productivity, trace element uptake and soil respiration will also be monitored.

25. (U) 8401 - 8409. Plant studies have been completed. The material has caused adverse effects in tomatoes and rats. Soil tests are in progress. Preliminary data indicate that the toxicity is diminished in soil.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA306104	2. DATE OF SUMMARY 84 09 15	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY A NEW	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISP'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	290
b. CONTRIBUTING				
c. ~~CONTRIBUTING~~	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Continuation of Field Ecological Assessment Procedures to Evaluate the Environmental Effects of Using Large Area Training Smokes

12. SUBJECT AREAS

06 21 Weapons Effects; 19 01 Ammunition, Explosives and Pyrotechnics; 06 02 Bioengineering

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 09	88 08	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 09 EXPIRATION 84 10

b. CONTRACT/GRANT NUMBER 84PP4870

c. TYPE d. AMOUNT 47042

e. KIND OF AWARD NEW f. CUM/TOTAL 47042

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.8	47
85	2.6	155

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*

Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL

PARMER, D L

d. TELEPHONE NUMBER *(include area code)*

301-663-7207

20. PERFORMING ORGANIZATION

a. NAME Construction Engineering Research Laboratory

b. ADDRESS

P.O. Box 4005
Champaign, IL 61820

c. NAME OF PRINCIPAL INVESTIGATOR

NOVAK, E

d. TELEPHONE NUMBER *(include area code)*

217-352-6511

21. GENERAL USE

Foreign Intelligence Not Applicable

MILITARY/CIVILIAN APPLICATION: H

f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*

(U) Smoke and Obscurants; (U) Ecological Assessment; (U) Risk Assessment; (U) RAD III; (U) P

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The proposed research will address the development of biological endpoints resulting from exposure to field concentrations of military smoke and obscurants. Additionally, key risk factors will be evaluated to determine human effects potential.

24. (U) Previous data collected on the observed genetic changes in the plant Tradescantia and a wild rodent after field smoke exposure will be evaluated and a report published. Other published methods of evaluating environmental changes due to chemical stress will be screened to determine procedures applicable to evaluating field exposure to smokes. Use scenario, toxicology, chemical properties and other data will be collected in order to develop a risk assessment for human (general public) exposure.

25. (U) None.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE. U.S. G.P.O. 1984-421-646/17001

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA0G0666	2. DATE OF SUMMARY 84 10 29	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 03 26	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	094
b. CONTRIBUTING				
c. XXXXXXXXXG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Determination of the Chronic Mammalian Toxicological Effects of TNT

12. SUBJECT AREAS
06 15 Pharmacology; 19 01 Ammunition, explosives, and pyrotechnics

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
79 09	85 01	DA	B Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 07	EXPIRATION 85 01	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-79-C-9120			
c. TYPE U	d. AMOUNT -0-	84	0.4	167
e. KIND OF AWARD CON	f. CUM/TOTAL 2299800	85	0.4	00

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME IIT Research Institute 10 West 35th Street
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Chicago, IL 60616
c. NAME OF RESPONSIBLE INDIVIDUAL BARKLEY, J J	c. NAME OF PRINCIPAL INVESTIGATOR LISH, P M
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 312-567-4874
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) TNT; (U) Toxicity; (U) Mammalian; (U) Chronic; (U) Carcinogenicity; (U) Lab Animals; (U) Rats; (U) Dogs; (U) RAD III

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To determine the mammalian chronic toxicity and carcinogenicity of TNT to provide data for the development of effluent guidelines for TNT from Army-owned ammunition plants.

24. (U) Studies will be performed to determine the chemical-biological interaction of TNT for chronic exposures to mammals. This will include assessments for carcinogenicity and teratogenicity. Also, detailed metabolic studies will be conducted to identify target organs.

25. (U) 8402 - 8407. The subchronic toxicity of TNT for rats has been defined. A 30-day range-finding feeding study and a six-month dog feeding study have been completed. Lifetime rat and mouse feedings are completed. Investigators are preparing final report.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE

U.S. G.P.O. 1984-421-646/17001

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 300100	2. DATE OF SUMMARY 84 10 09	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 05 09	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	075
b. CONTRIBUTING				
c. CONTRIBUTING	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Environmental Fate Studies of White Phosphorus/Felt and Red Phosphorus/Butyl Rubber Military Screening Smokes

12. SUBJECT AREAS
06 13 Microbiology; 07 02 Inorganic Chemistry; 07 03 Organic Chemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 09	85 01	DA	B Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 07	EXPIRATION 85 01	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-82-C-2320			
c. TYPE U	d. AMOUNT -0-	84	0.0	7
e. KIND OF AWARD SUP	f. CUM/TOTAL 679661	85	0.0	4

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME SRI International
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS 333 Ravenswood Avenue Menlo Park, CA 94025
c. NAME OF RESPONSIBLE INDIVIDUAL BARKLEY, J J	c. NAME OF PRINCIPAL INVESTIGATOR SPANGGORD, R J
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 415-326-6200
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Tumorigenicity; (U) Metabolism; (U) Initiation; (U) Promotion; (U) RAD III

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To provide laboratory data on the environmental fate of WP/F, RP/BR, and products of their manufacture and deployment, and to input appropriate rate constants defining the significant pathways into a computer simulation of environmental fate.

24. (U) In Phase I, to perform a literature search for information pertaining to WP/F and RP/BR. In Phase II, to create a scale model of deployment, to gather field samples and to determine significant degradative pathways. In Phase III, determine kinetic rate constants of dominant environmental pathways and to create an air, soil, and water computer simulation using data gathered.

25. (U) 8303 - 8407. The Phase I literature search is complete with a Final Report to be published soon. Phase II is nearly complete. As expected, oxidation and hydrolysis were found to be the most significant environmental pathways.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE. ☆ [illegible] 1984-421-646/10001

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA300090	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 04 01	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62720A	3E162720A835	AA	059
b. CONTRIBUTING				
c. [redacted]NG	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Dermal, Eye and Oral Toxicologic Evaluations

12. SUBJECT AREAS
06 06 Environmental Biology; 06 10 Industrial/Occupational Medicine

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 09	85 01	DA	B Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 10	EXPIRATION 85 01	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-82-C-2301			
c. TYPE J	d. AMOUNT -0-	84	0.4	37
e. KIND OF AWARD CON	f. CUM/TOTAL 210649	85	4.0	00

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Bioassay Systems Corporation
b. ADDRESS *(include zip code)* Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS 225 Wildwood Avenue, Woburn, MA 01801
c. NAME OF RESPONSIBLE INDIVIDUAL REDDY, G	c. NAME OF PRINCIPAL INVESTIGATOR MUNI, I A
d. TELEPHONE NUMBER *(include area code)* 301-663-7104	d. TELEPHONE NUMBER *(include area code)* 617-933-9229
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY/CIVILIAN APPLICATION: H	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Wood Preservatives; (U) Smokes/Obscurants; (U) Mammalian Toxicology; (U) Environmental Biology; (U) Lab Animals; (U) Rabbits; (U) Rats; (U) RAD III

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Definition of the acute and subacute toxicity of 15 compounds.

24. (U) The acute toxicity of military relevant compounds will be determined in oral and dermal toxicity tests, skin and eye irritation tests and skin sensitization potential.

25. (U) 8304 - 8409. Final report on wood preservatives, Phase I, is completed. Toxicity evaluation of Solvent Yellow, Solvent Green, SEX, compound EA5763 were deducted and carried out. All these compounds were found to be non-irritating to skin (0.5 g/site) and to eyes (0.1 g/eye) in rabbits. Solvent Yellow, Solvent Green and SEX have dermal LD50 values greater than 2000 mg/kg in rabbits and showed LD50 greater than 5000 mg/kg in sample oral dose to rats. Preparation of draft report is in progress.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA305606	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 03 19	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62777A	3E162777A878	CA	291
b. CONTRIBUTING				
c. CONTRIBUTING	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)* (U) Health Effects Research on Dimethylsulfoxide (DMSO) Munition Recrystallization Process Solvent. Phase II.

12 SUBJECT AREAS
06 20 Toxicology; 06 10 Industrial (occupational) Medicine

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 05	86 05	DA	D Other Gov't

17 CONTRACT/GRANT
a. DATE EFFECTIVE 84 05 EXPIRATION 85 01
b. CONTRACT/GRANT NUMBER 84PP4840
c. TYPE d. AMOUNT -0-
e. KIND OF AWARD CON f. CUM/TOTAL 131000

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	1.8	131
85	0.0	00

19 RESPONSIBLE DOD ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL DACRE, J C
d. TELEPHONE NUMBER *(include area code)* 301-663-2014

20. PERFORMING ORGANIZATION
a. NAME Laboratory for Energy-Related Health Research School of Veterinary Medicine
b. ADDRESS University of California Davis, CA 95616
c. NAME OF PRINCIPAL INVESTIGATOR GOLDMAN, M
d. TELEPHONE NUMBER *(include area code)* 916-752-1340
f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

21 GENERAL USE
Foreign Intelligence Not Applicable
MILITARY CIVILIAN APPLICATION H

22 KEYWORDS *(Precede EACH with Security Classification Code)* (U) Chemical Hazards; (U) Mutagenicity; (U) Health Protection; (U) Army Munitions; (U) RAD III; (U) PO

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To identify the mutagenic components of two munitions-related samples, identified as recycle solvent and evaporator sludge. These samples represent DMSO solutions of the munitions HMX, RDX, as well as several known and unknown degradation products.

24. (U) Chemical separation by high performance liquid chromatography will be combined with the Ames mutagenicity assay to isolate and purify the most mutagenic components of the mixture for subsequent identification by GC/MS. Known compounds will be compared with the components responsible for mutagenic effect. A mouse lymphoma mutation assay will further show that the suspect compounds are also capable of mutating mammalian cells. A final cell transformation assay will provide an in vitro test capable of identifying a candidate compounds carcinogenicity.

25. (U) 8405 - 8409. Technical work started in July 84 with Ames Assays on the compounds benzothiazole, dimethyl sulfone, and diacetone alcohol.

DD FORM 1498 83 MAR EDITION OF MAR 68 IS OBSOLETE ☆U.S. G.P.O. 1984-421-646/17001

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY	1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
	DAOH 0036	84 10 01	DD-DR&E(AR) 636

3. DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISB'N INSTR'N	9. LEVEL OF SUM A. WORK UNIT
84 05 14	D CHANGE	U	U		CX	

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62777A	3E162777A878	CA	294
b. CONTRIBUTING				
c. ~~CONTRIBUTING~~	STOG 82/83-6.2	2		

11. TITLE *(Precede with Security Classification Code)*
(U) Army Synthetic and Alternative Fuels Health Hazard Characterization

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 20 Toxicology; 06 01 Biochemistry

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 08	85 09	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 10	EXPIRATION 85 09	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	81PP1813			
c. TYPE	d. AMOUNT -0-	84	3.6	00
e. KIND OF AWARD CON	f. CUM/TOTAL 210000	85	1.0	80

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Oak Ridge National Laboratory Analytical Chemistry Division
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS P.O. Box X Oak Ridge, TN 37830
c. NAME OF RESPONSIBLE INDIVIDUAL REDDY, G	c. NAME OF PRINCIPAL INVESTIGATOR GUERIN, M R
d. TELEPHONE NUMBER *(include area code)* 301-663-7104	d. TELEPHONE NUMBER *(include area code)* 615-574-4862
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* FRY, R g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Shale Oil; (U) Diesel Fuel; (U) Chemical Characterization; (U) Toxicology; (U) Carcinogenicity; (U) RAD III; (U) PO

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Comprehensive chemical/physical characterization and definition of the toxicologic, mutagenic and carcinogenic effects potential of shale oil-derived versus petroleum-derived Army diesel fuel to support health protection criteria recommendations.
24. (U) Physical, chemical, and biological testing will be conducted using both a specially refined Army diesel fuel from shale oil and petroleum refined diesel fuel (DF-2). Focus is on health hazards from direct dermal and vapor inhalation exposures. Experimental approach includes physical and chemical characterization of the fuel mixtures; selected class fractionation and selected components evaluation for conduct and interpretation of biological testing; and then conduct of biological testing. Biological testing for health hazard evaluation will consist of: (1) mutagenicity testing using the Ames Salmonella assay and human cell DNA repair assay; (2) acute and subchronic toxicity; (3) complete carcinogenicity assay with the SENCAR mouse skin tumorigenicity assay; and (4) vapor phase inhalation toxicology assay.
25. (U) 8311 - 8409. Principal progress has been limited to further refinement of the chemistry and toxicology workplan tasks by ORNL based on their paralleling research experience with related synfuels and development of vapor generator technology. Major study progress has been repeatedly delayed due to the nonavailability of the shale oil-derived Army diesel fuel of principal study focus. The delay is the result of a failure of the DOD contractor to meet refinement objectives, causing a DOD cancellation and recent re-awarding to another refiner. Vapor generator technology has been developed. The chemical composition and conentration analysis of head space vapors from philip diesel fuel and shale derived fuels by G.LC are under progress.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 300021	2. DATE OF SUMMARY 84 07 19	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 04 04	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62777A	3E162777A878	CA	296
b. CONTRIBUTING				
c. XXXXXXXXXX	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) New Disinfection Agents for Water

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 09	84 11	DA	B Contract

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 07	EXPIRATION 84 11
b. CONTRACT/GRANT NUMBER	DAMD17-82-C-2257
c. TYPE S	d. AMOUNT -0-
e. KIND OF AWARD CON	f. CUM/TOTAL 217050

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	2.0	117
85	2.2	61

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Auburn University Water Resources Research Institute
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS 202 Hargis Hall 02140 Auburn University, AL 36849
c. NAME OF RESPONSIBLE INDIVIDUAL EATON, J C	c. NAME OF PRINCIPAL INVESTIGATOR WORLEY, G D
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 205-826-4043
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Disinfection; (U) Potable Water; (U) Microbiology; (U) Chlorination; (U) RAD III

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Evaluate the feasibility of using specific N-chloramines as disinfection agents for military field water supplies. Criteria for evaluating the new compounds include: effectiveness in killing pathogenic microorganisms, stability in storage and in water solution, low corrosivity and effectiveness in high chlorine-demand water.

24. (U) Compound I (3-chloro-4,4-dimethyl-2-oxazolidinone) shall be evaluated in combination with hypochlorite to provide both fast and long-term disinfection. New N-halomine compounds shall be synthesized and screened for stability and effectiveness as disinfectants. Promising candidates will be more extensively tested against a number of microorganisms.

25. (U) 8404 - 8406. Mixtures of 3-chloro-4,4-dimethyl-2-oxazolidinone (Compound I) and calcium hypochlorite have been prepared. These mixtures combine the capabilities of both quick kill of microorganisms and residual disinfection. Other N-chloramine and N-bromamine compounds have been synthesized and are being evaluated for stability and effectiveness as disinfectants for military field water supplies.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 304816	2. DATE OF SUMMARY 84 08 14	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 06 14	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62777A	3E162777A878	CA	298
b. CONTRIBUTING				
c. ~~CONTRIBUTING~~	STOG 82/83-6.2/2			

11. TITLE *(Precede with Security Classification Code)*
(U) Evaluation of Field Water Data Base Assessment Study Deliverables

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 06	85 08	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 06	EXPIRATION 84 10	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	84PP4851			
c. TYPE	d. AMOUNT 45000	84	0.6	45
e. KIND OF AWARD	f. CUM/TOTAL 45000	85	0.6	47

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Oak Ridge National Laboratory
b. ADDRESS *(include zip code)* Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS P.O. Box X, Oak Ridge, TN 37831
c. NAME OF RESPONSIBLE INDIVIDUAL SCHAUB, S A	c. NAME OF PRINCIPAL INVESTIGATOR ROSS, R H
d. TELEPHONE NUMBER *(include area code)* 301-663-7207	d. TELEPHONE NUMBER *(include area code)* 615-574-7797
21. GENERAL USE Foreign Intelligence MILITARY/CIVILIAN APPLICATION: Not Applicable H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Potable Water; (U) Toxicology; (U) Risk Assessment; (U) Field Analysis; (U) RAD III; (U) PO

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Effort will emphasize scientific evaluation of the scientific/engineering approaches and end items being developed by the Lawrence Livermore National Laboratory (LLNL) for a field water supply data base assessment study. The major thrust will be the evaluation of water quality standards recommendations and risk assessment indices being proposed by LLNL.

24. (U) A team of Oak Ridge National Laboratory (ORNL) personnel including chemists, epidemiologists, and toxicologists will review the study approaches and the end products being prepared by LLNL for inclusion in the new Army TB Med 577 (Sanitary Control and Surveillance of Field Water Supplies). The ORNL will prepare specific critical review packages for each task and item from the LLNL study for consideration by a DOD steering committee.

25. (U) 8406 - 8409. A technical review and assessment of new standards recommendations for field water constituents was performed. The constituents evaluated were: cyanide; arsenic; radionucleotides; sulfates; magnesium, chloride; color; turbidity; and total dissolved solids.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA300486	2. DATE OF SUMMARY 84 08 31	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 07 16	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63751A	3M463751D993	BA	001
b. CONTRIBUTING				
c. CONTRIBUTING	CARDS 1422A			

11. TITLE *(Precede with Security Classification Code)*
(U) Noninvasive Heart Rate Monitor

12. SUBJECT AREAS 06 02 Bioengineering; 15 02 Chemical, biological, and radiological warfare; 06 12 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 11	84 10	DA	B. Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 10	EXPIRATION 84 10	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-83-C-3019			
c. TYPE U	d. AMOUNT 0	84	1.3	154
e. KIND OF AWARD CON	f. CUM/TOTAL $291,038	85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Industrial and Biomedical Sensors Corp.
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS 1345 Main Street Waltham, MA 02154
c. NAME OF RESPONSIBLE INDIVIDUAL Thayer, C R	c. NAME OF PRINCIPAL INVESTIGATOR Chang, K-W
d. TELEPHONE NUMBER *(include area code)* 301-663-7527	d. TELEPHONE NUMBER *(include area code)* 617-891-4201
21. GENERAL USE Foreign Intelligence Considered MILITARY/CIVILIAN APPLICATION L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Heart; (U) Monitor; (U) Medical; (U) Field; (U) Noninvasive; (U) Volunteers; (U) RAM V

23 TECHNICAL OBJECTIVE 24 APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To develop a noninvasive heart rate monitor for use at field combat locations and during transportation.

24. (U) Determine validity of the design concept and approach of a noninvasive heart rate monitor and develop/fabricate one noninvasive heart rate monitoring device.

25. (U) (8407-8408) Phase II of the contract is continuing. The Noninvasive Heart Rate Monitor prototypes are being manufactured, but completion of the prototypes has been delayed due to an industry-wide shortage of quality integrated circuits and electronic components. Industrial and Biomedical Sensors Corporation (IBS) has requested a 4-week extension, which will move the completion date of phase II to 28 September 1984.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA300494	2. DATE OF SUMMARY 84 08 31	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 06 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63751A	3M463751D993	CA	002
b. CONTRIBUTING				
c. CONTRIBUTING	CARDS 1422A			

11. TITLE *(Precede with Security Classification Code)*
(U) Noninvasive Heart Rate Monitor

12. SUBJECT AREAS 06 02 Bioengineering; 15 02 Chemical, biological, and radiological warfare; 06 12 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 12	84 10	DA	B. Contract

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 10 EXPIRATION 84 10
b. CONTRACT/GRANT NUMBER DAMD17-83-C-3018
c. TYPE U d. AMOUNT 0
e. KIND OF AWARD CON f. CUM/TOTAL $150,705

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.2	50
85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL
Thayer, C R
d. TELEPHONE NUMBER *(include area code)*
301-663-7527

20. PERFORMING ORGANIZATION

a. NAME RCA Laboratories
b. ADDRESS
David Sarnoff Research Center
Princeton, NJ 08540
c. NAME OF PRINCIPAL INVESTIGATOR
Nowogrodzki, M
d. TELEPHONE NUMBER *(include area code)*
609-734-2521
f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY/CIVILIAN APPLICATION L

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Heart; (U) Monitor; (U) Medical; (U) Field; (U) Noninvasive; (U) Volunteers; (U) RAM V

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To develop a noninvasive heart rate monitor for use at field combat locations and during transportation.

24. (U) Determine validity of the design concept and approach of a noninvasive heart rate monitor and develop/fabricate one (1) noninvasive heart rate monitoring device.

25. (U) (8406-8408) Manufacture of the Noninvasive Heart Rate Monitor prototype is progressing but has slowed considerably due to an industry-wide shortage of quality electronic parts. RCA Laboratories has requested a 1-month extension to their contract with no additional funds. Prototypes and the spare parts will be delivered by 28 September 1984; functional drawings, manuals, and training package will be delivered by 31 October 1984.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA301115	2. DATE OF SUMMARY 84 09 06	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 05 20	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63751A	3M463751D993	BA	003
b. CONTRIBUTING				
c. [redacted]	CARDS 1422A			

11. TITLE *(Precede with Security Classification Code)*
(U) Noninvasive Chemical Casualty Vital Signs/Heart Rate Monitors

12. SUBJECT AREAS 06 02 Bioengineering; 15 02 Chemical, biological, and radiological warfare; 06 12 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 03	84 12	DA	B. Contract

17. CONTRACT/GRANT

a. DATE EFFECTIVE 83 03 EXPIRATION 84 12
b. CONTRACT/GRANT NUMBER DAMD17-83-C-3072
c. TYPE U d. AMOUNT 0
e. KIND OF AWARD CON f. CUM/TOTAL $353,531

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.0	0
85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL
Thayer, C R
d. TELEPHONE NUMBER *(include area code)*
301-663-7527

20. PERFORMING ORGANIZATION

a. NAME Decision Science, Inc.
Division of TITAN Systems, Inc.
b. ADDRESS
4901 Morena Boulevard
San Diego, CA 92117
c. NAME OF PRINCIPAL INVESTIGATOR
Halvorsen, K G
d. TELEPHONE NUMBER *(include area code)*
714-273-2922
f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

21. GENERAL USE
Foreign Intelligence Considered
MILITARY/CIVILIAN APPLICATION L

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Vital Signs; (U) Heart Rate; (U) Monitor; (U) Field Monitor; (U) Medical; (U) Noninvasive; (U) Volunteers; (U) RAM V

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To develop a noninvasive vital signs monitor and a heart rate monitor for use by field medical personnel at forward medical treatment facilities and during evacuation of patients.

24. (U) Develop a unique concept approach for obtaining vital signs data and design/fabricate prototypes for evaluation.

25. (U) (8305-8409) Production of the prototype noninvasive heart rate monitor is nearing completion. Due to delays in delivery of electronic components, the contractor has requested a 2-week extension to phase I of the contract. This will change only the delivery date for all deliverables under phase I from 31 August 1984 to 14 September 1984.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE. U.S. G.P.O. 1984-421-646/17001

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA301113	2. DATE OF SUMMARY 84 08 02	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 04 24	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	62772A	3916277 2A993	BA	004
b. CONTRIBUTING				
c. COXXXXXXXXG	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Noninvasive Chemical Casualty Vital Signs Monitor

12. SUBJECT AREAS 06 02 Bioengineering; 15 02 Chemical, biological, and radiological warfare; 06 12 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 02	85 02	DA	B. Contract

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 05	EXPIRATION 85 02	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	DAMD17-83-C-3064	84	1.3	294
c. TYPE U	d. AMOUNT 0	85	2.1	475
e. KIND OF AWARD CON	f. CUM/TOTAL $ 721,333			

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME GMS Engineering Corp.
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS 8970-E Route 108, P.O. Box 2277 Columbia, MD 21045
c. NAME OF RESPONSIBLE INDIVIDUAL Thayer, C R	c. NAME OF PRINCIPAL INVESTIGATOR Samaras, G M
d. TELEPHONE NUMBER *(include area code)* 301-663-7527	d. TELEPHONE NUMBER *(include area code)* 301-596-4110
21. GENERAL USE Foreign Intelligence Considered MILITARY/CIVILIAN APPLICATION L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Heart; (U) Monitor; (U) Medical; (U) Field; (U) Noninvasive; (U) RAM V; (U) RAM II

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To develop a noninvasive vital signs monitor for use by field medical personnel at the Battalion Aid Station and rear echelon areas.

24. (U) Determine validity of the design concept and approach of a noninvasive vital signs monitor and develop/fabricate six (6) preproduction prototypes and spare parts.

25. (U) (8404-8408) The contractor has built a breadboard instrument that has been successful in obtaining heart rate and blood pressure of a casualty wearing chemical protective clothing in the environment of the M113 Armored Personnel Carrier. Due to the concentration of a redesign effort, additional funding and time were needed to complete the contract. Delivery of digital printed circuit boards was delayed; therefore, delivery of prototypes is now expected the week of 10 September 1984.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DAOG7067	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 03 19	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63751A	3M463751D993	BA	005
b. CONTRIBUTING				
c. CXXXXXXXXG	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Chemical Warfare Agent Patient Protective Wrap

12. SUBJECT AREAS 06 02 Bioengineering; 15 02 Chemical, biological, and radiological warfare; 06 12 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
81 06	84 12	DA	D. Other Gov't

17. CONTRACT/GRANT
a. DATE EFFECTIVE 83 12 EXPIRATION 84 12
b. CONTRACT/GRANT NUMBER 81II1012
c. TYPE d. AMOUNT 0
e. KIND OF AWARD CON f. CUM TOTAL $265,000

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.0	0
85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL
Reams, W H
d. TELEPHONE NUMBER *(include area code)*
301-663-7527

20. PERFORMING ORGANIZATION
a. NAME US Army Natick Research and Development Center
b. ADDRESS
Natick, MA 01760
c. NAME OF PRINCIPAL INVESTIGATOR
Snow, P
d. TELEPHONE NUMBER *(include area code)*
617-653-5434

21. GENERAL USE
Foreign Intelligence Considered
MILITARY/CIVILIAN APPLICATION M

f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Chemical Defense; (U) Patient Treatment; (U) Chemical Agent Protection; (U) Bioengineering; (U) Volunteers; (U) IAO; (U) RAM V

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To develop a chemical warfare patient protective wrap capable of protecting decontaminated patients in a field environment from all known chemical agents without the need for the patient to have other protective gear. This item is required in the chemical warfare battlefield scenario.

24. (U) Contractor will develop a minimum of six prototype wraps which will be comparatively evaluated against the current British wrap.

25. (U) (8401-8409) Six candidate fabric materials have been identified by the US Army Natick Research and Development Center and prototypes were made from each. Liquid agent tests are under way at Dugway Proving Ground, UT. Vapor and aerosol testing will be done at the Chemical Research and Development Center, Aberdeen Proving Ground, MD; estimated start date is November 1984. Physiological testing will be done at the US Army Research Institute of Environmental Medicine, Natick, MA, at approximately the same time. Data from these tests will be used to select the fabric and final design configuration for the wrap. A limited user evaluation in lieu of a formal operational test is tentatively scheduled for April 1985.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA303070	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 06 14	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9 LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63751D	3M463751D993	CA	006
b. CONTRIBUTING				
c. [illegible]	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Resuscitation Device, Individual, Manually Operated, Field

12. SUBJECT AREAS 06 02 Bioengineering; 15 02 Chemical, biological, and radiological warfare; 06 12 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16 PERFORMANCE METHOD
84 01	84 12	DA	B. Contract

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 01 EXPIRATION 84 12

b. CONTRACT/GRANT NUMBER DAMD17-84-C-4014

c. TYPE U d. AMOUNT 0

e. KIND OF AWARD CON f. CUM TOTAL $190,954

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.8	191
85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL
Malek, J W

d. TELEPHONE NUMBER *(include area code)*
301-663-7277

20 PERFORMING ORGANIZATION

a. NAME MSA Research Corporation
Div. of Mine Safety Appliances Co.

b. ADDRESS
Evans City, PA 16033

c. NAME OF PRINCIPAL INVESTIGATOR
Rankin, R L

d. TELEPHONE NUMBER *(include area code)*
412-538-3510

21. GENERAL USE
Foreign Intelligence Considered
MILITARY CIVILIAN APPLICATION M

e. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Ventilation; (U) Resuscitation; (U) Medical; (U) Field; (U) Manually Operated; (U) Individual; (U) Medical Equipment; (U) RAM V

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To design and develop a manually operated, compact, lightweight medical device, which can be operated by an individual soldier, to ventilate chemical warfare agent casualties in a field environment.

24. (U) Current technology and equipment will be reviewed for applicability to the design concepts, and parameters will be specified to design a device meeting the requirements. Devices will be designed and fabricated for test and evaluation.

25. (U) (8401-8409) Initial design approaches were proposed by MSA Research Corporation and were thoroughly reviewed to reduce weight and cube. A final design was agreed upon during a site visit, 10 September 1984. The contractor has begun fabrication of test prototypes with delivery scheduled for end of 1st Quarter FY 85.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA303157	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 03 09	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8 DISB'N INSTR'N BP	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63751A	3M463751D993	CA	007
b. CONTRIBUTING				
c. CODES	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Filter System - Resuscitation Device, Individual, Chemical (Burgin Adapter)

12. SUBJECT AREAS 06 02 Bioengineering; 15 02 Chemical, biological, and radiological warfare; 06 12 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 10	84 09	DA	F. Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 83 10 | EXPIRATION 84 09
b. CONTRACT/GRANT NUMBER 84II4002
c. TYPE | d. AMOUNT 0
e. KIND OF AWARD CON | f. CUM TOTAL $92,000

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	1.0	92
85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL
Malek, J W
d. TELEPHONE NUMBER *(include area code)*
301-663-7277

20. PERFORMING ORGANIZATION

a. NAME US Army Armament, Munitions and Chemical Command
b. ADDRESS
Chemical Research and Development Center
Aberdeen Proving Ground, MD 21010
c. NAME OF PRINCIPAL INVESTIGATOR
Boardway, J
d. TELEPHONE NUMBER *(include area code)*
301-671-2707
f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

21. GENERAL USE
Foreign Intelligence Considered
MILITARY CIVILIAN APPLICATION M

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Resuscitation; (U) Medical; (U) Field; (U) IAO; (U) Manually Operated; (U) Individual; (U) Chemical Warfare Filter; (U) Filter; (U) RAM V

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To design and develop a filter system for use with a Resuscitation Device, Individual, Chemical, to ventilate chemical warfare agent casualties in a field environment.

24. (U) Design, fabricate, and evaluate a filter system based on requirements stated in a statement of work.

25. (U) (8403-8409) Agreement on the final design features proposed by the Chemical Research and Development Center, Aberdeen Proving Ground, MD, was reached on 8 August 1984. Fabrication was initiated with delivery of the systems scheduled for 1st Quarter FY 85.

DD FORM 83 MAR 1498 EDITION OF MAR 68 IS OBSOLETE

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA304538	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 07 12	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63751A	3M463751D993	CA	008
b. CONTRIBUTING				
c. CONTRIBUTING	CARDS 1425R			

11. TITLE *(Precede with Security Classification Code)*
(U) Military Transportable Field Radiographic and Fluoroscopic System

12. SUBJECT AREAS
06 05 Clinical medicine; 06 12 Medical and hospital equipment

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 06	87 06	DA	B. Contract

17. CONTRACT GRANT

a. DATE EFFECTIVE 84 10 EXPIRATION 85 09
b. CONTRACT/GRANT NUMBER DAMD17-84-C-4181
c. TYPE U d. AMOUNT 0
e. KIND OF AWARD CON f. CUM/TOTAL $7,518,571

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	23	7518
85	49	6082

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory
b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010
c. NAME OF RESPONSIBLE INDIVIDUAL
O'Connor, R J
d. TELEPHONE NUMBER *(include area code)*
301-663-7527

20. PERFORMING ORGANIZATION

a. NAME Picker International Defense Division
b. ADDRESS
595 Miner Road
Highland Heights, OH 44143
c. NAME OF PRINCIPAL INVESTIGATOR
Browne, D W
d. TELEPHONE NUMBER *(include area code)*
216-449-3000
e. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

21. GENERAL USE
Foreign Intelligence Not Applicable
MILITARY CIVILIAN APPLICATION H

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) X-Ray; (U) Field Medicine; (U) Field Equipment; (U) Radiology; (U) RAM II; (U) RAM V

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To develop a Military Transportable Field Radiographic and Fluoroscopic System and deliver prototypes and the complete technical data package for the system.

24. (U) Development contract.

25. (U) (8406-8409) Delivery of full-scale mockups is anticipated by 1st Quarter FY 85. Preliminary specifications for several subsystems have been prepared. Design review for the system is scheduled for November 1984.

DD FORM 1498 83 MAR EDITION OF MAR 68 IS OBSOLETE.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA303963	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 03 26	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63751A	3M463751D993	CA	009
b. CONTRIBUTING				
c. CONTRIBUTING	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) A Portable Oxygen Concentrator for Emergency Use

12. SUBJECT AREAS
06 12 Medical and hospital equipment; 06 02 Bioengineering

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 04	84 09	DA	B. Contract

17. CONTRACT GRANT

a. DATE EFFECTIVE 84 04 | EXPIRATION 84 09

b. CONTRACT/GRANT NUMBER DAMD17-84-C-4106

c. TYPE U | d. AMOUNT 0

e. KIND OF AWARD CON | f. CUM TOTAL $58,868

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	1.0	59
85	0.0	0

19. RESPONSIBLE DOD ORGANIZATION

a. NAME US Army Medical Bioengineering Research & Development Laboratory

b. ADDRESS *(include zip code)*
Fort Detrick
Frederick, MD 21701-5010

c. NAME OF RESPONSIBLE INDIVIDUAL
Prensky, W C

d. TELEPHONE NUMBER *(include area code)*
301-663-7527

20. PERFORMING ORGANIZATION

a. NAME Maxdem Incorporated

b. ADDRESS
2047 Las Lunas Street
Pasadena, CA 91107

c. NAME OF PRINCIPAL INVESTIGATOR
Marrocco, M

d. TELEPHONE NUMBER *(include area code)*
213-356-9951

21. GENERAL USE
Foreign Intelligence Not Applicable

MILITARY CIVILIAN APPLICATION L

e. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)*
(U) Medical; (U) Oxygen; (U) Portable; (U) Battery Powered; (U) RAM V

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To demonstrate the feasibility of developing an electrically powered device using a novel concept for the separation and concentration of oxygen from the air.

24. (U) Materials and techniques of superoxide chemistry will be utilized to electrically separate oxygen from the air and concentrate it for field medical use.

25. (U) (8404-8409) The Maxdem oxygen pump is a novel, electrochemical process for concentrating oxygen from air. It is projected to be four to five times more efficient than the best pressure swing adsorption devices. In the phase I effort, electrodes and solvent systems were found which support the necessary electrochemical steps. Progress was also made toward finding materials that will meet practical engineering requirements. A phase I report has been received.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY	1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
	DA302231	84 10 01	DD-DR&E(AR) 636

DATE PREV SUM'RY	4. KIND OF SUMMARY	5. SUMMARY SCTY	6. WORK SECURITY	7. REGRADING	8. DISP'N INSTR'N	9. LEVEL OF SUM
83 11 18	D CHANGE	U	U		DX	A. WORK UNIT

NO. CODES	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
PRIMARY	63764A	3M463764D995	AA	031
CONTRIBUTING				
[illegible]NG	CARDS			

TITLE *(Precede with Security Classification Code)*

(U) Teratology Studies on Agent GD

SUBJECT AREAS

06 10 Industrial (occupational) Medicine; 06 20 Toxicology

START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 06	85 09	DA	D Other Gov't

CONTRACT/GRANT

DATE EFFECTIVE 83 11 | EXPIRATION 85 09

CONTRACT/GRANT NUMBER 83PP3812

TYPE | d. AMOUNT -0-

KIND OF AWARD CON | f. CUM TOTAL 193448

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORK YEARS	b. FUNDS *(In thousands)*
84	0.0	133
85	2.1	00

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Food & Drug Administration National Ctr. for Toxicological Research
ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Division of Teratogenesis Research Jefferson, AR 72079
NAME OF RESPONSIBLE INDIVIDUAL DACRE, J C	c. NAME OF PRINCIPAL INVESTIGATOR LaBORDE, J B
TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 501-541-4307
GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY CIVILIAN APPLICATION H	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

KEYWORDS *(Precede EACH with Security Classification Code)* (U) Agents; (U) GD; (U) Teratology; (U) Health Effects; (U) Lab Animals; (U) RAD V; (U) Rats; (U) Rabbits; (U) PO

23 TECHNICAL OBJECTIVE 24 APPROACH 25 PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To investigate the teratogenic potential of agent GD since many female Army personnel are susceptible to accidental exposure to GD, eg. researchers.

24. (U) Studies will be conducted using standard federally-approved protocol in both rats and New Zealand white rabbits.

25. (U) 8311-8409. Upgrading of facility to receive and handle neat chemical agent. Studies are in progress on the rabbit teratology.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 300105	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 11 18	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63764A	3M463764D995	AA	032
b. CONTRIBUTING				
c. CONTRIBUTING	CARDS			

11. TITLE *(Precede with Security Classification Code)*

(U) Teratology Studies on Agent GB

12. SUBJECT AREAS

06 10 Industrial (occupational) Medicine; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 09	84 09	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 83 11	EXPIRATION 84 09	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	82PP2815			
c. TYPE	d. AMOUNT -0-	84	3.0	145
e. KIND OF AWARD CON	f. CUM/TOTAL 894345	85	2.0	105

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Food and Drug Administration National Center for Toxicological Research
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Division of Teratogenesis Research Jefferson, AR 72079
c. NAME OF RESPONSIBLE INDIVIDUAL DACRE, J C	c. NAME OF PRINCIPAL INVESTIGATOR LaBORDE, J B
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 501-541-4307
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY/CIVILIAN APPLICATION: H	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Agents; (U) GB; (U) Teratology; (U) Health Effects; (U) RAD V; (U) Lab Animals; (U) Rats; (U) Rabbits; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To investigate the teratologic potential of Type I GB, Type II GB and 99% pure GB. The Army Surgeon General has directed that definitive teratology studies be performed because of possible exposures of females to the agent.

24. (U) Studies will be conducted using standard federally-approved protocol in both rats and New Zealand white rabbits.

25. (U) 8311 - 8409. Studies of Type I GB and Type II GB using rats have been completed and results are being analysed. A draft final report of Type I GB in the rat has been completed. Studies of Type I GB and Type II GB using rabbits are in progress.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA302726	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 11 18	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63764A	3M463764D995	AA	033
b. CONTRIBUTING				
c. [redacted]NG	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Teratology Studies on Lewisite and Sulfur Mustard Agents

12. SUBJECT AREAS
06 20 Toxicology; 06 10 Industrial (occupational) Medicine

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 05	85 10	DA	D Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 84 10	EXPIRATION 85 10	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	83PP3810			
c. TYPE	d. AMOUNT 39626	84	1.3	98
e. KIND OF AWARD EXT	f. CUM/TOTAL 436094	85	1.1	112

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Battelle Pacific Northwest Laboratories Department of Energy
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Battelle Boulevard Richland, WA 99352
c. NAME OF RESPONSIBLE INDIVIDUAL FINCH, R A	c. NAME OF PRINCIPAL INVESTIGATOR HACKETT, P L
d. TELEPHONE NUMBER *(include area code)* 301-663-7104	d. TELEPHONE NUMBER *(include area code)* 509-376-5685
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Teratology; (U) Sulfur Mustard; (U) Lewisite; (U) Lab Animals; (U) Rats; (U) Rabbits; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Many Army personnel, including females, are occupationally susceptible to accidental exposure to Lewisite and sulfur mustard, e.g. researchers. The objective is to evaluate the potential for teratogenicity of these compounds in laboratory animals.

24. (U) The study will be conducted in both rats and New Zealand white rabbits in accordance with the guidelines set forth by the Interagency Regulatory Liaison Group.

25. (U) 8311 - 8409. The laboratory facilities at Battelle Pacific Northwest Laboratories (DOE) have been upgraded and approved for neat agent use. Dose-range-finding studies for sulfur mustard in rats are in progress. The definitive sulfur-mustard rat teratology study is scheduled to start on approximately 1 Oct 84.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA303237	2. DATE OF SUMMARY 84 09 13	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 83 09 19	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISP'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63764A	3M463764D995	AA	034
b. CONTRIBUTING				
c. [redacted]	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Filmless Radiology (Digital Imaging)

12. SUBJECT AREAS
06 05 Clinical medicine; 06 12 Medical and hospital equipment; 06 02 Bioengineering

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
83 09	85 09	DA	D. Other Gov't

17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		
a. DATE EFFECTIVE 83 09	EXPIRATION 85 09	FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
b. CONTRACT/GRANT NUMBER	83MM3519			
c. TYPE	d. AMOUNT $ 463,445	84	4.0	200
e. KIND OF AWARD SUP	f. CUM/TOTAL $1,053,598	85	4.0	463

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Uniformed Services University of the Health Sciences School of Medicine
b. ADDRESS *(include zip code)* Fort Detrick, Frederick, MD 21701-5010	b. ADDRESS 4301 Jones Bridge Road, Bethesda, MD 20814
c. NAME OF RESPONSIBLE INDIVIDUAL Salisbury, L L	c. NAME OF PRINCIPAL INVESTIGATOR Allman, R M
d. TELEPHONE NUMBER *(include area code)* 301-663-7527	d. TELEPHONE NUMBER *(include area code)* 202-295-3145
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: L	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Filmless Radiology; (U) Digital Imaging; (U) Digital X-Ray; (U) Filmless X-Ray; (U) Teleradiology; (U) RAM II; (U) RAM V; (U) MIPR

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) The technical objective of this effort is to identify the critical digitization parameters for clinically diagnostic radiographs. This information will be used to develop Department of Defense performance specifications for digital radiograhic equipment.

24. (U) The approach will be to establish communication links between remote clinical sites and a central receiving facility and to establish referral and reporting patterns. A panel of experts will compare conventional film techniques with various digitizing methods.

25. (U) (8309-8409) Four remote clinical sites have been established and instrumented. The exchange and evaluation of data have started.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 300087	2. DATE OF SUMMARY 84 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY 84 10 16	4. KIND OF SUMMARY D CHANGE	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63764A	3M463764D995	AA	035
b. CONTRIBUTING				
c. [redacted]NG	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Toxicity Studies on Agent VX

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
82 09	85 12	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 05	EXPIRATION 84 10
b. CONTRACT/GRANT NUMBER 82PP2816	
c. TYPE	d. AMOUNT -0-
e. KIND OF AWARD CON	f. CUM/TOTAL 1029713

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	8.0	320
85	2.0	135

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Department of Energy Laboratory of Energy-Related Health Research
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS University of California Davis, CA 95616
c. NAME OF RESPONSIBLE INDIVIDUAL DACRE, J C	c. NAME OF PRINCIPAL INVESTIGATOR GOLDMAN, M
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 916-752-1340
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Agents; (U) VX; (U) Toxicology; (U) Teratology; (U) Health Effects; (U) Laboratory Animals; (U) RAD V; (U) Rats; (U) Rabbits; (U) Chickens; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To investigate the teratologic and mutagenic potential and health hazards of agent VX.

24. (U) Studies will be conducted using standard protocols in rats, New Zealand white rabbits, and chickens.

25. (U) 8405 - 8409. The following draft final reports have been received: Ames Assay, Saccharomyces Assay, Mouse Lymphoma Assay, teratology in the rabbit, and delayed neuropathy in the chicken (acute doses).

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RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 305392	2. DATE OF SUMMARY 84 10 16	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY A NEW	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63764A	3M463764D995	AA	036
b. CONTRIBUTING				
c. [illegible]NG	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Toxicity Studies on Agents GB and GD

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 09	85 08	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 09	EXPIRATION 85 09
b. CONTRACT/GRANT NUMBER	84PP4855
c. TYPE	d. AMOUNT 421382
e. KIND OF AWARD NEW	f. CUM/TOTAL 421382

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.1	421
85	5.9	00

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME US Department of Energy Laboratory for Energy-Related Health Research University of California
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Davis, CA 95616
c. NAME OF RESPONSIBLE INDIVIDUAL DACRE, J C	c. NAME OF PRINCIPAL INVESTIGATOR GOLDMAN, M
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 916-752-1340
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(If available)* g. NAME OF ASSOCIATE INVESTIGATOR *(If available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Toxicity; (U) Mutagenicity; (U) Sarin (GB); (U) Soman (GD); (U) In Vitro Tests; (U) RAD V; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To investigate the toxic and mutagenic potential and health hazards of agents GB and GD.

24. (U) The toxic and mutagenic potential of agents GB and GD will be assessed using the following in vitro assays: Ames Test, Mouse Lymphoma Assay, In Vitro Sister-Chromatid Exchange Assay, and Unscheduled DNA Synthesis in Rat Hepatocytes. If required, an in vivo cytogenetics assay also will be performed using laboratory rodents.

25. (U) None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 305445	2. DATE OF SUMMARY 84 10 16	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY A NEW	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N CX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63764A	3M463764D995	AA	037
b. CONTRIBUTING				
c. XXXXXXXXXX	CARDS			

11. TITLE *(Precede with Security Classification Code)* Chemistry and Toxicology of Water Treated with Hypochlorite to Detoxify Chemical Agent VX

12. SUBJECT AREAS
06 20 Toxicology; 07 03 Organic Chemistry; 06 09 Hygiene and Sanitation

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 09	85 12	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 09	EXPIRATION 85 12
b. CONTRACT/GRANT NUMBER	84PP4858
c. TYPE	d. AMOUNT 66000
e. KIND OF AWARD NEW	f. CUM/TOTAL 66000

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	0.6	66
85	3.3	325

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Battelle Memorial Institute Pacific Northwest Labs
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS P.O. Box 999 Richland, WA 99352
c. NAME OF RESPONSIBLE INDIVIDUAL ROSENBLATT, D H	c. NAME OF PRINCIPAL INVESTIGATOR KALKWARF, D R
d. TELEPHONE NUMBER *(include area code)* 301-663-2014	d. TELEPHONE NUMBER *(include area code)* 509-376-3809
21. GENERAL USE Foreign Intelligence Not Applicable MILITARY/CIVILIAN APPLICATION: H	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)* g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) VX; (U) Hypochlorite; (U) Hypochlorous Acid; (U) Chlorination; (U) Chemical Agents; (U) Water Treatment; (U) Detoxification; (U) Decontamination; (U) RAD V; (U) Lab Animals; (U) Rats; (U) PO

23. TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) Verify previous evidence for increased anti-ChE activity when hypochlorite reacts with a stoichiometric ratio of chemical agent VX in dilute aqueous solution; correlate this effect with toxicity and blood ChE levels in rats; and identify chemical intermediates and products formed in aqueous solutions of VX and hypochlorite.

24. (U) Dilute aqueous solutions of VX will be mixed with near-stoichiometric ratios of hypochlorite solution at pH 7 to test for increased anti-ChE activity with time. Should anti-ChE activity increase with time, the reaction mixture will be quenched and retested to see if the increase is reversible. Studies will be conducted to test the toxicity of hypochlorite-treated VX solutions injected into rats. VX solutions will be mixed with hypochlorite at various values of pH, VX concentration and VX:hypochlorite ratios; the identities and concentrations of the products will be sought by analytical techniques.

25. (U) None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 305394	2. DATE OF SUMMARY 84 10 16	REPORT CONTROL SYMBOL DD-DR&E(AR) 636
3. DATE PREV SUM'RY	4. KIND OF SUMMARY A NEW	5. SUMMARY SCTY U	6. WORK SECURITY U	7. REGRADING	8. DISB'N INSTR'N DX	9. LEVEL OF SUM A. WORK UNIT

10. NO./CODES:	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
a. PRIMARY	63764A	3M463764D995	AA	038
b. CONTRIBUTING				
c. XXXXXXXXXG	CARDS			

11. TITLE *(Precede with Security Classification Code)*
(U) Toxicity Studies on Lewisite and Sulfur Mustard Agents

12. SUBJECT AREAS
06 10 Industrial (occupational) Medicine; 06 20 Toxicology

13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING ORGANIZATION	16. PERFORMANCE METHOD
84 09	87 03	DA	D Other Gov't

17. CONTRACT/GRANT

a. DATE EFFECTIVE 84 09	EXPIRATION 85 10		
b. CONTRACT/GRANT NUMBER	84PP4865		
c. TYPE	d. AMOUNT 500000		
e. KIND OF AWARD NEW	f. CUM/TOTAL 500000		

18. RESOURCES ESTIMATE

FISCAL YEARS	a. PROFESSIONAL WORKYEARS	b. FUNDS *(In thousands)*
84	7.1	500
85	7.1	500

19. RESPONSIBLE DOD ORGANIZATION	20. PERFORMING ORGANIZATION
a. NAME US Army Medical Bioengineering Research & Development Laboratory	a. NAME Battelle Pacific Northwest Laboratories Department of Energy
b. ADDRESS *(include zip code)* Fort Detrick Frederick, MD 21701-5010	b. ADDRESS Battelle Boulevard Richland, WA 99352
c. NAME OF RESPONSIBLE INDIVIDUAL FINCH, R A	c. NAME OF PRINCIPAL INVESTIGATOR SASSER, L
d. TELEPHONE NUMBER *(include area code)* 301-663-7104	d. TELEPHONE NUMBER *(include area code)* 509-376-2560
21. GENERAL USE Foreign Intelligence Not Applicable	f. NAME OF ASSOCIATE INVESTIGATOR *(if available)*
MILITARY/CIVILIAN APPLICATION: H	g. NAME OF ASSOCIATE INVESTIGATOR *(if available)*

22. KEYWORDS *(Precede EACH with Security Classification Code)* (U) Tumorigenicity; (U) Metabolism; (U) Initiation; (U) Promotion; (U) RAD V; (U) Rats; (U) PO

23 TECHNICAL OBJECTIVE 24. APPROACH 25. PROGRESS *(Precede text of each with Security Classification Code)*

23. (U) To investigate the toxic and mutagenic potential and health hazards of lewisite and sulfur mustard.

24. (U) The toxic and mutagenic potential of lewisite and sulfur mustard will be assessed using the following tests: Ames Test, CHO/HGPRT Forward Mutation Assay, In Vitro Sister-Chromatid Exchange and Chromosome Aberration Assay, and Unscheduled DNA Synthesis in Rat Hepatocytes. If required, an in vivo cytogenetics assay also will be performed using laboratory rodents. In addition to these tests, a 90-day subchronic toxicity study, a modified dominant lethal study, and a 2-generation reproductive toxicity study will be performed using laboratory rats.

25. (U) None.

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